

# Antiquity

## A Quarterly Review of Archaeology

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### Varia

THAT Egypt still holds rich prizes both for the archaeologist and the field-investigator—if we may coin a phrase—is shown by recent discoveries there. Not only have important intact finds of associated objects been made but the even more astonishing discovery that ‘some elders of a certain native village possess a genuine, though limited, family tradition of the Coptic language. There, the last stage of ancient Egyptian, hitherto supposed to have died out completely by the 16th century of our era, still has a little use as a “secret” language’. The discovery was made by Werner Vycichl, who will publish an account of it in the *Mitt. d. deutschen Instituts für Ägyptische Altertumskunde* in Kairo. (*Amer. Journ. of Archaeology*, 1936, XL, 551, 554).



‘The Eleusinian hill, on the east slope of which the famous sanctuary of Demeter was located, can very properly be compared to those on which the famous citadels of Tiryns and Mycenae were constructed’. On it was found, in the season 1933-4, an amphora whose upper limit of date is put at about 1200 B.C. It bears an inscription in primitive alphabetic script which has been transcribed as

pa-i|da|ku-ka-vo-ne-da

and translated ‘Oh, maiden, this potion here (I offer, dedicate or accept)’. The maiden is Persephone, the daughter of Demeter, both of whom, together with the potion *κυκέων* were closely associated with the Eleusinian mysteries. (*Amer. Journ. of Archaeology*, 1936, XL 426-31).

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In the same Journal (p. 485), is an account, with ground-plan and illustrations, of the oriental basilica of S. Giovanni à Porta Latina in Rome. Parts of the walls of A.D. 500 are still to be seen.



In pulling down an old house at Cambridge, the bones of a stork were found. It seems that the stork made its nest on the chimney and it, or one of the young storks, had fallen down. This proves that storks must have been endemic in England up to quite a recent date. There is no doubt about the identification of the bones ; but it is to be hoped that a full account of the circumstances of this most interesting discovery will be published in due course.



The Trustees of the British Museum have acquired with the aid of a gift of £500 from the National Art-Collections Fund, six very remarkable pieces of Babylonian sculpture, all unlike any specimens so far in the collection. Their exact provenance is not known. The most striking and important is a steatite bowl, of the Agade period (about 2500 B.C.) which has carved round the vertical band of its outer surface a finely designed continuous frieze in low relief of human and animal scenes and other decoration. A grey granite vase, of some 500 years earlier, and attributable to Erech, also has a low exterior relief, this showing two spirited groups of a lion attacking a bull. A bronze figure of a naked woman holding a bottle is unique so far as discoveries have yet gone for its period (c. 2300-2000 B.C.), the naked female figure never occurring except on clay plaques of poor artistic quality.

Mr M. E. L. Mallowan has presented to the Trustees the share allotted to him as excavator of his finds at Tell Chagar Bazar and in the Khabur Valley in North Syria, consisting of tablets, seals, figurines, pottery, and other small antiquities, collectively valuable as providing (in the case of the tablets) secure dating points and throwing light on little known periods of the civilizations forming the link between the Mesopotamian cities and the Mediterranean.



A seal-impression with a ' minute but excellently executed figure of a stag ' figured on it, has been found at Tepe Gawra by the Joint Assyrian Expedition of the American School of Oriental Research. ' It is now absolutely certain that stamp seals were . . . in use at an early phase of the Tell Halâf period '. (*BASOR*, February 1937, p. 5).



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‘ In the corner of a room [in Gawra XII], just under the floor, was found a pot filled with beads of carnelian, lapis lazuli, turquoise, and containing in addition a large stamp seal of marble and six gold beads, half of these being of the fluted type. The gold beads are interesting not on account of their number or workmanship, but chiefly because their occurrence in Gawra XII gives us the earliest relative date established for this metal so far ’. (*ibid.* pp. 5, 6).



The Schweich Lectures for 1937 were delivered by Claude Schaeffer, Director of the Ras Shamra excavations, during January. The three lectures dealt in turn with the history of Ras Shamra, whose ancient name was Ugarit ; with the library and cuneiform texts, and with the religious texts. The lectures were illustrated by lantern-slides and were very well attended.



A correspondent has sent us a cutting from the *Western Morning News* (4 Feb.), showing a pair of ox-horns attached to the chimney of a house in Horn Lane, Cullompton, Devon. They are said to have belonged to an ox which ploughed up that part of Kentismoor which was enclosed in 1808. In 1928 they were blown down, but were replaced in 1930 (for foreign instances see *ANTIQUITY*, 1936, x, 97-8, 223, 475).



MR IORWERTH PEATE writes on ‘ Presely ’ :—

‘ As the person responsible for introducing this form to modern archaeology (“ A Note on the name Presely ” in *Arch. Camb.* 1930, pp. 407-9), perhaps I may be permitted to state briefly my reasons for doing so. Since *Prescelly* represents only a poor attempt at bringing the spelling to conform with an uneducated pronunciation of the place-name, it is inadmissible though countenanced by the Ordnance Survey. Dr Ifor Williams favours *Preselau* as the map and literary form but points out that the later development of this medieval form is towards *Presele* or *Presely*. Now in the same county, the place-name *Pontsely* is also found. This fact leads me to believe that the derivation is *prys-seleu* or *sely* (as suggested by Dr Williams in 1930) and that it is useless to hunt for the imaginary *presel*. Consequently since *Presely* (1) represents the legitimate modern development of the early form *Presseleu*, (2) conforms with the local pronunciation, (3) is analogous

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with a related place-name from the same area, and (4) is more recognizable to non-Welsh readers than *Preselau* as the accepted form to replace the hybrid *Prescelly*, I hope that—with Preselite—it will be universally adopted'.



BRONZE FLANGED  
AXE  
from Östergötland  
Sweden (1)

~ ~ ~

DR J. G. D. CLARK writes :—

In the note (ANTIQUITY, March 1937, pp. 95 ff) on a flanged bronze axe, said to have come from Greece, Professor V. Gordon Childe commented on the fact that it was perforated near the butt by a circular hole. This hole, he suggested, might ultimately have derived from the 'notch' commonly found in the butts of all types of Italian bronze axes from the early flanged form to the late winged palstave; the transition could have been effected by the closing of the notch across the top of the axe.

Whether or not this explanation is correct it seems worth recalling the existence of a parallel to the allegedly Greek axe in the hope that the feature may be recognized more widely. The flanged axe here illustrated was found in a fen at Målbäck, Grebo parish, in the Swedish province of Östergötland\*; it differs from the 'Greek' specimen in the shape of the perforation, but seems to afford a close parallel in its general features.



As we go to press we hear from Mr A. H. A. HOGG that a section has been cut across the causewayed ditch of the camp on West Wickham Common (see *post*, p. 223), 85 feet north of the level causeway near the supposed entrance. No evidence of date was found. The original ditch at that point had a very blunt V section, 8 feet deep, and was about 30 feet wide at the top.



Our notes on the Prehistoric Society in the March number have aroused interest. The address of the Secretary is 78 Chesterton Road, Cambridge.

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\* O. Montelius, *Minnen från vår forntid*, fig. 809; A. Nordén, *Östergötlands Bronsålder*, Linköping, 1925, p. 14, and pl. I, fig. 11.



## Querns

by E. CECIL CURWEN

WHEN excavating in the hill-fort of Cissbury a few years ago the writer found nothing by which to date a certain group of pits except a piece of a revolving handmill (FIG. 23). Even this could not supply the necessary chronological evidence, because the developmental history of the quern or hand-mill had not yet been worked out in sufficient detail to enable one to say that a certain form is characteristic of a certain period. Being thus impressed with the need for such a study the writer endeavoured to collect data, but was met at the outset with the difficulty that of all the hand-mills preserved in our Museums extremely few have been dated at all closely by associated finds of pottery—at least so far as records go—while it seems to be exceptional even for modern excavators to note such associations when querns are found. After all, it is, as Pitt Rivers said, the common objects that are often more important than the rare ones, just because they are common, and it is surely one of the prime objects of excavation to obtain data for the study of the evolution, not only of pottery, but of all common objects.

As the case stands, then, very little can yet be said with any assurance on this subject, and the purpose of the present paper is to formulate a tentative scheme as a basis of study, in the hope of stimulating others to observe and record the necessary data upon which alone a more reliable and detailed classification can be based. For the present, therefore, we shall not attempt an exhaustive review of hand-mills, but confine ourselves to a consideration of what appear to be the leading types in evolutionary order.

By far the best study that has appeared on this subject is contained in the first volume of Bennett and Elton's *History of Corn-Milling* (1898), to which we are indebted for much of the available material; this book is a mine of information, but needs bringing up to date. We are, happily, emerging from that state of blissful ignorance of the subject which made possible such an anachronism as Décamps' well-known picture of 'Samson grinding in the Prison-house', wherein



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Samson is seen turning a huge mill-stone by means of a long lever like a capstan-bar, after the fashion of the Roman slaves a thousand years later. As well depict King Alfred burning the cakes at Athelney on a gas-cooker.

So deeply rooted in our minds has the idea become that a mill must revolve or spin that the term has of late been applied to quite unrelated machinery used for spinning cotton. The word, however, comes from a root meaning to pound or crush (compare 'muller'), and so far is it from having any rotatory significance that for thousands of years the only known mills, such as the *μύλη* of Homer, were simply contrivances for rubbing grain between two stones of convenient shape. On the other hand it may be that the word 'quern', which has many cognate forms in the Teutonic languages, properly signifies only a revolving hand-mill; but its use has been so freely extended to cover other types that there seems little reason now to restrict it to the rotary quern. Thus may some compensation be made for the extended application of the word 'mill'.

Hand-mills, or querns, then, may be broadly divided into two main classes, viz. those in which the upper stone revolves on the lower, and those in which the movement is to-and-fro or irregular. The latter class is the earlier and will be discussed first.

### I. NON-ROTATING HAND-MILLS

(1) MORTARS. The use of a stone to pound food-stuffs such as roots or acorns in a natural or artificial rock-basin is said to go back to palaeolithic times. Whether the basin was in a fixed or movable rock is an unimportant detail, but the whole contrivance was in effect a primitive pestle and mortar. In such a basin large roots or small grains could equally well be pounded, and mortars continued to be used for pounding corn in Rome right down to the first century A.D., some hundreds of years after more efficient mills had been introduced. In fact, the Latin *pistor*, a baker, meant literally one who pounds in a mortar, for bakers normally ground their own corn, and the name continued even when the mortar had given place to the donkey-mill.

(2) GRAIN-RUBBERS. In most parts of Europe the introduction of wheat with the Neolithic culture led to the differentiation of a special kind of mortar suited to the grinding, rather than pounding, of small grains. This was effected by making the stone basin wide and shallow, like a saucer, while the 'pestle' became squat and bun-shaped, so that it could be held in one hand and swept round and round the lower stone,



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or to and fro in any direction. Such a 'grain-rubber' is the characteristic 'mill' of the British Neolithic A phase and is plentifully found in our causewayed camps, such as Windmill Hill (Avebury, Wilts) and Whitehawk (Brighton) (PLATE II, 1). The existence of such an implement is usually taken as evidence that its owner possessed corn, and this seems to hold good with regard to Britain, but it must be remembered that in some countries a non-agricultural people might have developed a similar 'mill' for grinding the seeds of wild plants.<sup>1</sup> Grain-rubbers of this kind are still used by some African peoples for grinding their corn.<sup>2</sup>

(3) SADDLE-QUERNS. Although in the case of the grain-rubber the small bun-shaped upper stone could be carried by the hand round and round the saucer-shaped lower stone, or in any direction, an examination of the signs of wear on such stones shows that one direction was often favoured more than another, resulting in a more or less to-and-fro motion. One advantage of this was that a larger upper stone could be used, because the to-and-fro movement permitted both hands to be used on it. This led to the development of the true 'saddle-quern', in which a bolster-shaped upper stone lies athwart an elongated lower stone (PLATE II, 4). The latter has a grinding surface which is more or less concave longitudinally, while from side to side it may be flat or else slightly concave or even convex. In the last case the stone is saddle-shaped, whence the type is named. The upper stone is typically bolster-shaped, and its grinding surface convex from side to side. Variations naturally occur, and the grain-rubber develops into the saddle-quern by gradual stages.

Although the grain-rubber is typical of the British Neolithic A phase, the true saddle-quern had already appeared on the Continent and in the Near East. In Egypt models have been found depicting the method of its use (FIG. 1): a slave-girl kneels on the ground with the lower stone before her, placed so that its grinding surface slopes somewhat away from her; she grasps the upper stone in both hands and alternately pushes and pulls it backwards and forwards the length of the lower stone, bending her body at knees and hips in so doing. Releasing one hand from time to time she feeds the grain on to the nearer end of the lower stone, whence it percolates down the slope between the two stones as it is ground, and falls off the far end in the form of meal.

<sup>1</sup> My attention has been drawn to this point by Professor Gudmund Hatt of Copenhagen.

<sup>2</sup> e.g., on the Gold Coast; see photo in *Peoples of All Nations* (edited by J. A. Hammerton, Amalgamated Press, Ltd.), p. 596.

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The method is still employed by some African peoples in identical fashion, and one of the Late Bronze Age saddle-querns from New Barn Down in Sussex is so shaped that the grinding-surface slopes at just such an angle as the Egyptian representations show, viz. about 20 degrees<sup>3</sup> (PLATE II, 2).

It is important to realize that whenever one reads of a mill in the Old Testament or in Homer one must picture a saddle-quern such as we have just described, for no other type was then known. This will explain, for instance, the appropriateness of the preposition used in the phrase 'the maidservant that is *behind* the mill' (Exodus xi, 5), for



FIG. 1. EGYPTIAN STATUETTE ILLUSTRATING THE USE OF THE SADDLE-QUERN. (5th Dynasty)

*After Bennett and Elton*

while one may sit beside a rotary quern, one can best be described as kneeling behind a saddle-quern. Similarly the 'upper millstone' which might not be taken to pledge (Deuteronomy xxiv, 6) is literally the 'rider' in Hebrew, for it rides on the lower stone as on a saddle. It is also interesting to note that the manna which the Israelites used as a substitute for corn, was not only ground in mills but beaten in mortars (Numbers xi, 8), and the survival of the mortar for pounding corn is attested by a well-known passage in the book of Proverbs (Prov. xxvii, 22). Finally, when Samson was captured by the Philistines and put to grind in the prison-house (Judges xvi, 21) he was made to do the work of a slave-girl, labouring at the saddle-quern.

<sup>3</sup> *Sussex Arch. Coll.*, 1934, LXXV, 167.



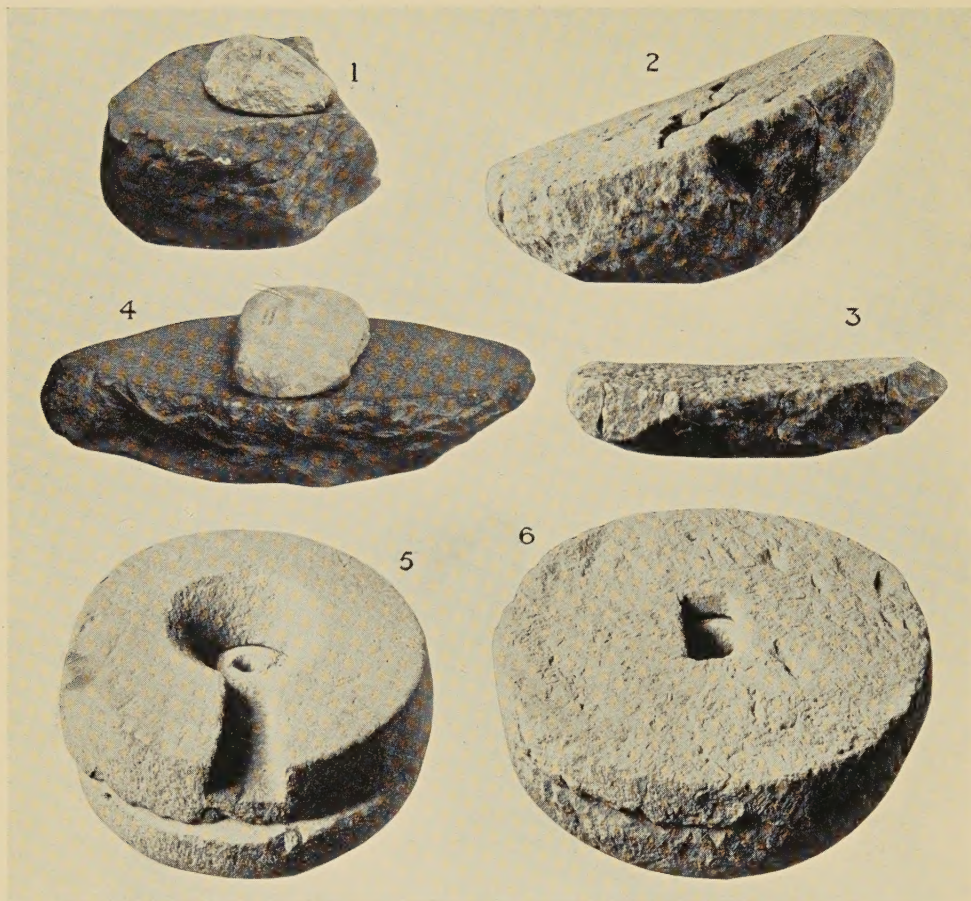
PLATE I



POUNDING IN A MORTAR: ISLE OF FOULA, SHETLAND  
*ph. H. B. Curwen, 1902*



## PLATE II



### SOME QUERN TYPES

1. Part of a Neolithic Grain-Rubber, Whitehawk Camp, Brighton (Brighton M.)
2. Late Bronze Age Saddle-Quern (lower stone); New Barn Down, Sussex (Worthing M.)  
Note angle of inclination, and compare with fig. 1 (p. 136)
3. Late Bronze Age Saddle-Quern (lower stone); New Barn Down, Sussex (Worthing M.)  
Note small type, also common in Iron Age A
4. Well-developed Saddle-Quern; note bolster-shaped upper stone, seen foreshortened (p. 135)
5. Early Romano-British Rotary Quern, Iwer, Bucks (*cf.* fig. 17); typologically should be 1st cent. A.D.  
Note radial groove for handle
6. Early Romano-British Rotary Quern, Hassocks, Sussex (*cf.* fig. 18); probably 2nd cent A.D.  
Note absence of hole or groove for handle



# PLATE III

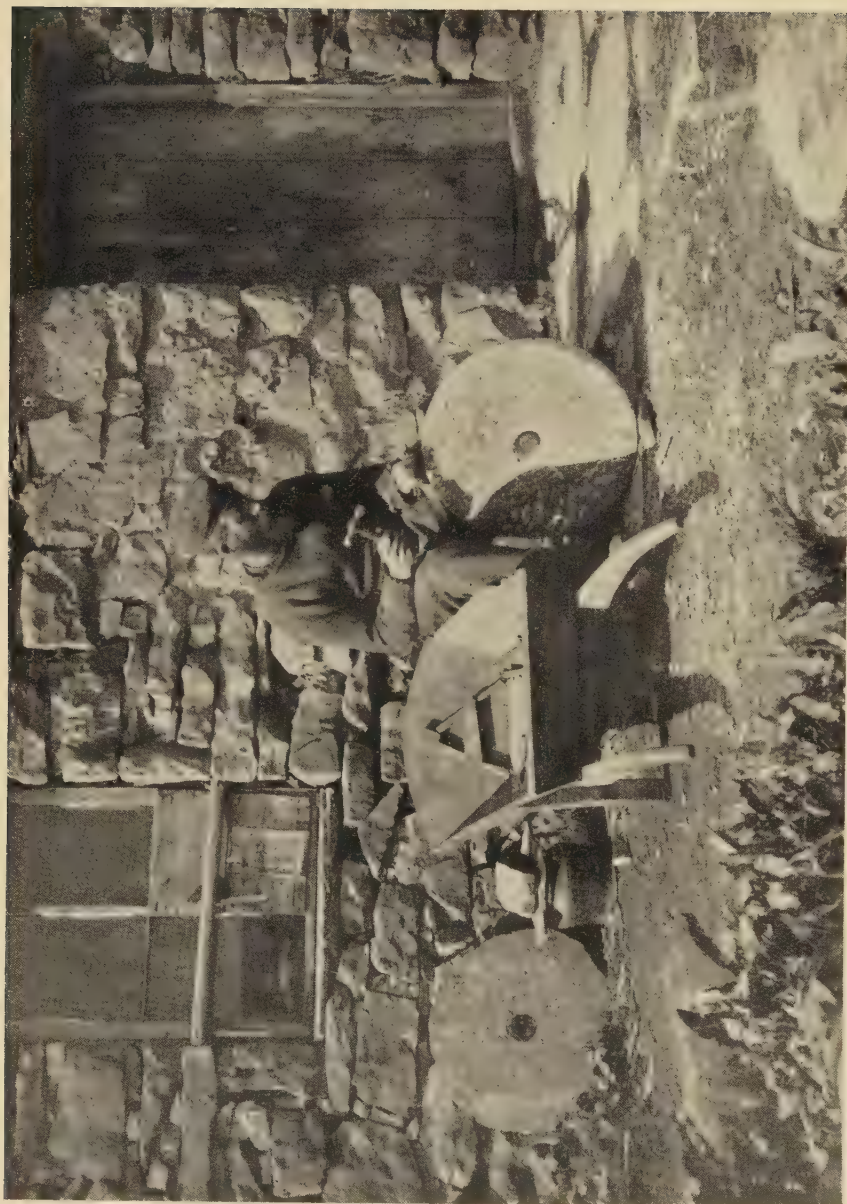


MODERN QUERN MOUNTED FOR USE: ISLE OF FOULA, SHETLAND

*ph. H. B. Curwen, 1902*

Note beneath the table the end of the lever, or bridge-tree, which carries the spindle supporting the upper stone. By raising or lowering this plank (by twisting or untwisting the cord) fine adjustment can be made for grinding coarse or fine (see fig. 39 and p. 144)

PLATE IV



QUERN-MAKER AT WORK: ISLE OF FOULA, SHETLAND

*ph.* H. B. Curwen, 1902



## QUERNS

The true saddle-quern may have been introduced by the megalith builders, for a characteristically elongated upper stone was found built into a megalithic burial chamber on Samson, Scilly Isles.<sup>4</sup> The evidence of statuettes shows that this form of mill goes back at least as far as the 3rd dynasty in Egypt.<sup>5</sup> At the present day it is still used by certain African races and in Mexico.<sup>6</sup> In Britain its use practically ceased with the Early Iron Age ; Romano-British specimens are very rare, two from a settlement at Westbury (A.D. 100-400) being in the Devizes Museum. A specimen was also found in a Saxon hut at Bourton on the Water.<sup>7</sup>

### II. ROTATING HAND-MILLS

The origin of the rotating mill is still wrapped in obscurity. Archaeological evidence as to its origin is so far lacking, though it is hoped that what is said here may stimulate research in Mediterranean lands, where the clue is undoubtedly to be found. A little light may be obtained from literary references to donkeys grinding corn, for in the absence of more explicit details it is difficult to see how a donkey could work any other than a large revolving mill turned by a lever like that of a capstan. By metonymy the upper mill-stone came to be called the 'donkey' in Greek, and the earliest use of this term goes back to Xenophon (400 B.C.), Aristotle, and Alexis (350 B.C.<sup>8</sup>) ; and it is noticeable that such references occur much earlier in Greek than in Latin literature, and also that the donkey-mill is referred to long before the rotary hand-mill. So far as the literary evidence goes, one is led to suspect that the principle of the revolving mill may have been invented in Greece in the form of a donkey-mill—certainly before 400 B.C. ; that this later spread to Rome ; and that the rotary quern may have been derived from the donkey-mill by application of the rotary principle to the domestic mill in country districts.

The revolving mill is so great an advance on any previous appliance that it cannot possibly have come into being by the normal process of development. With the possible exception of the potter's wheel it is the earliest piece of machinery to replace an oscillating movement by a

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<sup>4</sup> *Antiq. Journ.*, 1933, XIII, 27, 29.

<sup>5</sup> Bennett and Elton, *History of Corn-milling* (1898), I, 38-9.

<sup>6</sup> *Ibid.*, p. 79.      <sup>7</sup> *Ant. Journ.*, XII, 290.

<sup>8</sup> Xenophon, *Anabasis*, I, 5, 5 ; Aristotle, *Probl.* 35, 3 ; Alexis, *Amph.* I, *Pyraun*, 4.

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continuous rotary one. This is the principle of most modern machinery, whereby, for instance, we have the circular saw instead of the to-and-fro movement of the hand-saw, and the propeller instead of oars. Such an advance could only have been the product of a brilliant engineer or mathematician—some forgotten forerunner of Archimedes, who failed to achieve the immortality of the classics.

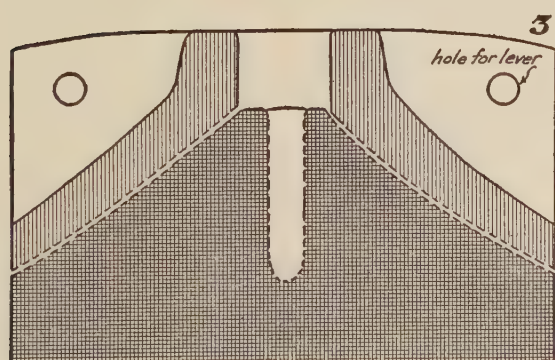
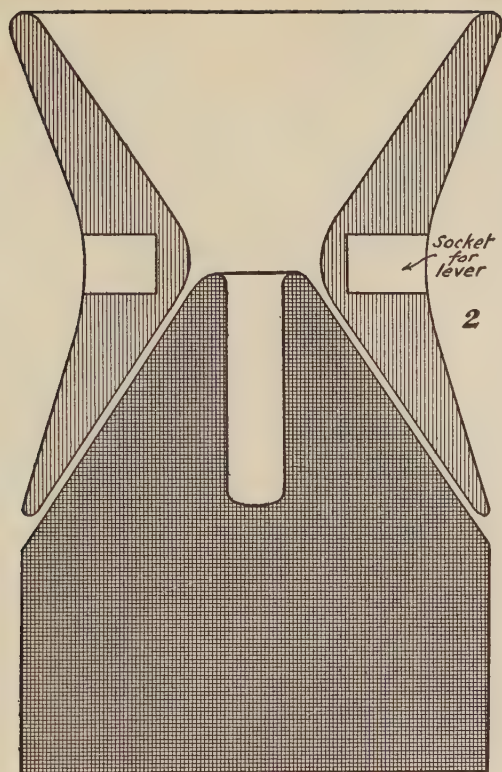
We have no knowledge of the form of the earliest Greek donkey-mills, but we have Roman examples of the 1st century A.D., such as those at Pompeii (FIG. 2). Such a mill consisted of a lower stone (*meta*) in the form of a cone, the apex of which carried the iron spindle which supported the upper stone (*catillus*). The grinding surface thus sloped steeply down from the apex at an angle which might be as much as 35 or 40 degrees. The upper stone consisted of a hollow cone—sometimes two hollow cones placed apex to apex; one fitted over the conical lower stone, while the other served as a hopper into which the grain was thrown. An iron bridge, called in English the *rynd*, was placed across the narrowest part of the opening between the two hollow cones, and rested on the top of the spindle. Thus the grinding surfaces of the two stones were not necessarily in actual contact with one another, and the grain thrown into the hopper percolated down the slope between the two stones, to emerge in the form of meal at the circumference. The upper stone was turned by means of two large horizontal levers set in sockets on its sides; to these levers donkeys or other animals might be harnessed, or slaves were chained, and the unfortunate creatures were made to walk round and round in incessant circles.

The downward slope of the grinding surfaces is a clear relic of the tilt of the saddle-quern to which allusion has been made, as is also the way in which the meal escapes from the mill by gravity when it is ground fine enough to do so. Of the saddle-quern itself in classical Greece and Rome the writer knows no archaeological evidence,<sup>9</sup> nor does there appear to be any literary evidence of it. The Romans had, it is true, a mill which they called *mola trusatilis*, or pushing-mill, and this was considered by Bennett and Elton to refer to the saddle-quern because it is not an inapt description of it, and the term seemed to them to be in contrast to the *mola versatilis*, or revolving mill. It is, however, equally likely that it may have referred to the slaves pushing the long levers of the rotary mill as they walked round and round it. Aulus

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<sup>9</sup> The saddle-quern was, however, the mill of Homer, as has been pointed out.





# DONKEY AND SLAVE MILLS

Fig. 2. General type, based on specimens at Pompeii

Fig. 3. From Ham, near Poole, Dorset, made of lava (British Museum)

*Lower stones are cross-hatched*

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Gellius, for instance (A.D. 150) says that Plautus, who lived 350 years before, laboured 'at turning the mills which are called pushing-mills',<sup>10</sup> and Cato (150 B.C.) includes in the equipment needed for an oliveyard of 240 acres '1 donkey-mill, 1 pushing-mill, 1 Spanish mill', while for a vineyard of 100 acres he recommends '3 donkey-mills, 1 pushing-mill'.<sup>11</sup> It seems unlikely that so insignificant a contrivance as a single saddle-quern would be required in addition to three efficient donkey-mills. On the other hand the mortar remained popular in Rome at least as late as the first century A.D., but by the 4th century seems to have been no longer used for corn.

The first unmistakable references to rotary hand-mills seem to be those of Virgil (70-19 B.C.), particularly the fine description of the peasant grinding his corn on one, and mashing his herbs in a *mortarium*, in preparation of something suspiciously like a haggis.<sup>12</sup> The impression one gains from looking through these classical references is that the donkey and slave mills were a product of the increasing sophistication and complexity of town-life, and that the rotary hand-mill was an adaption of the new machine for the benefit of the peasants who lived far from the towns, and still had to grind their own corn at home.

The story of the rotary quern on the Continent still remains to be worked out. In Britain it makes its first appearance between 100 and 50 B.C., and it seems likely that it was first introduced by the Iron Age B folk, for while it has not been found on sites that show only Iron Age A1 and A2 pottery, it is present in Iron Age B and AB sites, such as the Glastonbury Lake-village and Maiden Castle, and is sometimes found in sites that antedate Iron Age C, as at the Trundle (FIGS. 4-14).

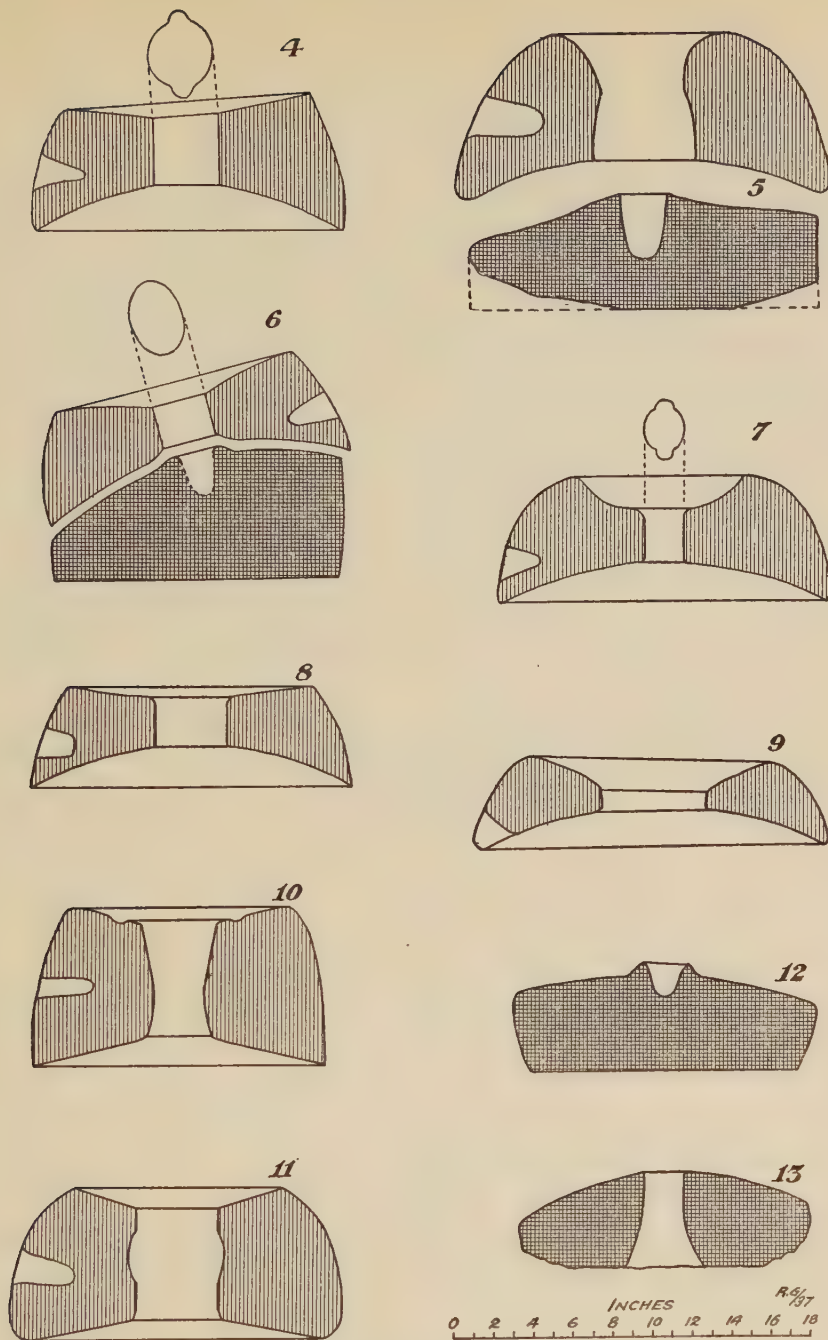
(1) PRE-ROMAN TYPE (FIGS. 4-14). The earliest form of the rotary quern in Britain betrays its close relationship with the donkey-mill. The stones are of small diameter (generally about 12 to 14 inches), and each is excessively thick (from 6 to 8 inches). The lower stone is usually conical, the slope of the grinding surface being commonly about 20 degrees, and there is a central socket for the wooden spindle which supported the upper stone. In many cases the grinding surface, instead of being conical, is shaped like a segment of a sphere. The upper stone is often nearly hemispherical or bee-hive-shaped externally—hence the term 'bee-hive quern'—but it may have a hollow on top to serve as a hopper for the grain, or the top may be practically flat.

<sup>10</sup> Aulus Gellius, III, 3.

<sup>11</sup> Cato, *R.R.*, x, 4; XI, 4.

<sup>12</sup> Virgil, *Moretum*, 19-30, 39.





#### PRE-ROMAN ROTARY QUERNS FROM WESSEX

Figs. 4, 5. Maiden Castle, Dorchester (Iron Age B)

Fig. 6. Provenance uncertain (Dorchester M.)

Fig. 7. Kingbarrow Quarry, Portland (Dorchester M.)

Fig. 8. Fifield Bavant (Devizes M.), associated with pottery decorated with 'swags', and having foot-rings, therefore probably after 50 B.C.

Fig. 9. Twyford Down, Winchester (before 50 B.C.). *After* James Stuart

Fig. 10. Ham Hill, Somerset (Taunton M.)

Figs. 11-13. Glastonbury Lake Village (Glastonbury M.) Note completely perforated lower stone (fig. 13), dating before A.D. 70

*Lower stones are cross-hatched*

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The grinding surface is a hollow cone or segment of a hollow sphere, to correspond with that of the lower stone. The upper stone was turned by means of a horizontal handle which projected radially from a socket in the side or from a groove on the top, if the latter is flat. The perforation through the upper stone may be oval or circular in section, but in the latter case there may be two slots, one on either side of it, extending right through the stone and virtually converting the circular perforation into an oval (FIGS. 4, 7, 14). The object here was to allow space for the grain to pass the rynd, which in hand-mills was generally of wood, and rested on the top of the wooden spindle.

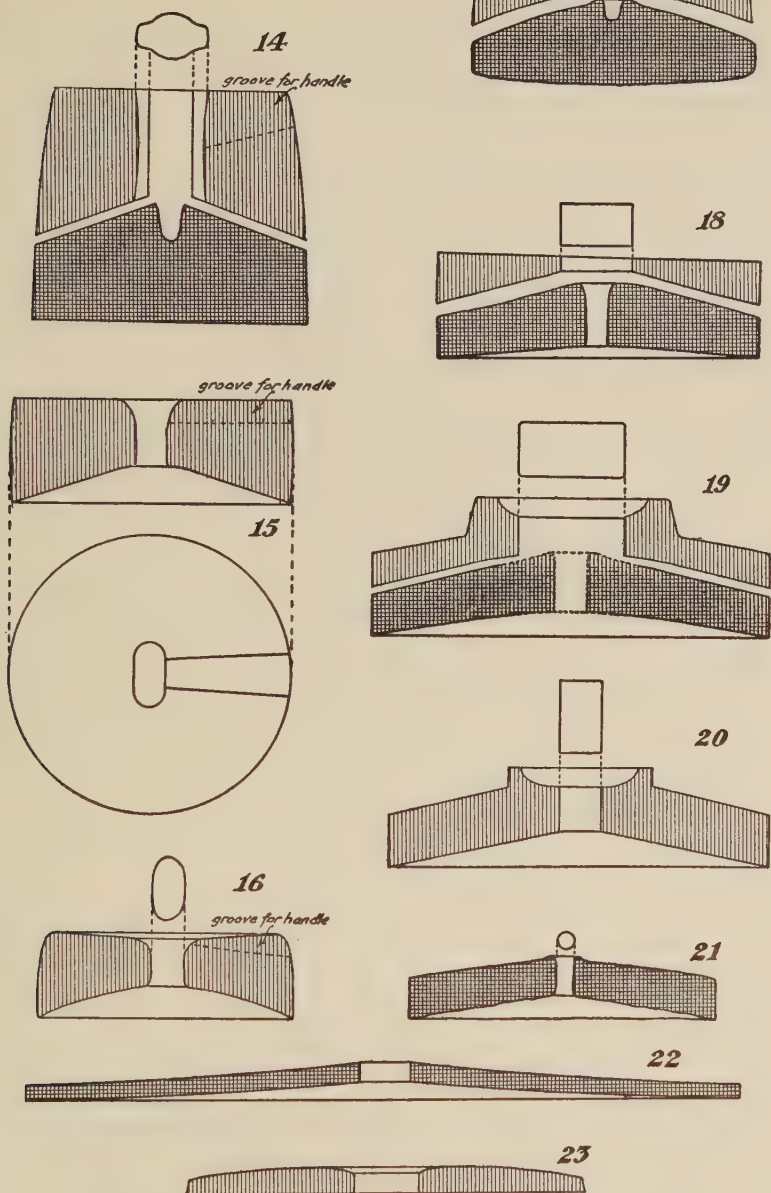
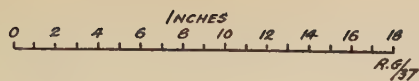
The relationship between these early rotary querns and the donkey-mills seems to be shown by—(1) the convexity of the lower stone, whether conical or a segment of a sphere; (2) the possession, in many cases, of a hollow basin on top to serve as a hopper; and (3) the radial position of the handle which recalls the levers of the donkey-mill but is less convenient in a hand-mill than the upstanding handle of later querns.

These early querns seem to fall into two classes: (1) the Wessex type (FIGS. 4–13), in which there is generally some kind of hopper: the handle is inserted in the side of the upper-stone, and the grinding-surfaces form a segment of a sphere (less frequently a cone); and (2) the Sussex type (FIG. 14), in which the top is flat; the handle, though still projecting radially, is placed in a groove on the flat top, and the grinding-surfaces are conical. Whether or not these distinctions are significant it is difficult to say.

A third class, apparently derived from the Wessex type, possesses a similar thick and heavy upper stone, cheese-shaped, bee-hive or conical, but is distinguished by the fact that the grinding surfaces are practically flat (slope not exceeding 3 degrees). Both this and the Wessex type were found at Ham Hill, Somerset (FIGS. 10, 24), but the largest number of them occurred at the Iron Age AB hill-fort of Hunsbury, near Northampton. This class, which we may call the Hunsbury type, is important because it appears to have been a product of the northward spread of the Iron Age B culture, and to have been ancestral to what we have ventured to call the Roman legionary type of quern (see p. 148).

(2) ROMANO-BRITISH DOMESTIC TYPES (FIGS. 15–22). During the Roman period the rotary quern in southern Britain underwent development from the clumsy Iron Age type to neater and lighter forms. The general tendency was towards an increase of diameter with diminution





# THE DEVELOPMENT OF THE ROMANO-BRITISH DOMESTIC QUERN

- Fig. 14. The Trundle, Sussex (before 50 B.C.) (Lewes M.)
- Figs. 15, 16. Hardham *mansio*, Sussex (A.D. 50-150) (Lewes M.)
- Fig. 17. Iwer, near Uxbridge (Lewes M.) (cf. plate II, 7)
- Fig. 18. Hassocks, Sussex (mainly 2nd cent. A.D.) (Lewes M.) (cf. plate II, 8)
- Fig. 19. Thundersbarrow Hill (village-site, 4th cent. hut) (Hove M.)
- Figs. 20, 21. Richborough.
- Fig. 22. Pevensey; faintly grooved (4th cent. A.D.) (Lewes M.)
- Fig. 23. Cissbury: period of re-fortification (Worthing M.)

*Lower stones are cross-hatched*

## ANTIQUITY

of thickness, and consequently a reduction in the slope of the grinding-surfaces. It should be possible to date the stages in this development, but at present certain points remain obscure, and all one can do is to suggest an outline which it is hoped may stimulate others to fill in the details, or else to emend.<sup>13</sup>

We suggest, therefore, that it may be possible to recognize two general types—an earlier and a later Romano-British—which are more or less directly descended from the 'bee-hive' quern of Sussex.

(a) *Flat-topped : early Romano-British* (FIGS. 15-18 and PLATE II, 5, 6). In the earlier type the upper stone may be about 15 in. wide and 2½ in. thick, with a flat, horizontal top, a perforation that is at first oval and later rectangular, and a grinding surface that slopes at not more than 15 degrees. The lower stone is of similar thickness, and generally has a central socket for the spindle, sometimes surrounded by a slight lip (FIG. 17). At some period during this stage the central socket was replaced by a complete perforation (FIG. 18), an improvement to which we shall return presently. The under-surface of the lower stone was left rough, but is more or less flat.

(b) *Projecting hopper type : later Romano-British* (FIGS. 19-21). The later Romano-British type of quern shows rather more elegance in its construction. The slope of the grinding-surfaces is reduced to about 10 degrees, and the upper surface of the top-stone also slopes downwards and outwards at a similar angle. The summit of the quern is furnished with a hopper which projects above it ; the outer face of this is nearly vertical, while the inner face is basin-shaped, and slopes down to the perforation which again is rectangular. The lower stone has a round central perforation instead of a socket, and there is a tendency for the under-surface to be slightly concave, so that it may be roughly parallel to the grinding surface. This type of quern is commonly of larger diameter, and may be 20 in. or more ; a fragment from Selsey in the possession of Mr W. L. White must have belonged to a quern 3 ft. 7 in. across and only 2 in. thick.

The complete perforation of the lower stone is evidence of the adoption of a device for adjusting the upper stone to grind fine or coarse at will (FIG. 39 and PLATE III). This device, which could be seen in actual use in the querns of the Hebrides in recent times, allowed the spindle which supported the upper stone to pass right through the

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<sup>13</sup> In attempting to date querns typologically it should be remembered that the life of a single specimen might be 70 or 80 years—at least in Scotland ; Bennett and Elton, *op. cit.*, 159, 170.



## QUERNS

lower stone, to rest on a movable lever below it.<sup>14</sup> From the chronological aspect we need to know when this device (1) first appeared, (2) became general, and (3) became universal. The earliest specimen of a completely perforated lower stone that the writer has noted was found at the Glastonbury lake village,<sup>15</sup> where it must date before A.D. 70 (FIG. 13). In confirmation of this early date the stone is  $4\frac{1}{2}$  in. thick and 15 in. in diameter, while the grinding-surface has a slope of about 20 degrees. It may be to this device that Columella refers (about A.D. 42) when he says that the upper stone can be easily adjusted so that even olives can be crushed by them.<sup>16</sup> As to when its adoption became general and finally universal, no opinion can yet be offered. Probably it will be found that the older method was discontinued during the second century.

The practice of grooving the grinding surfaces of querns had a two-fold object, viz., to make the grinding more effective, and to facilitate the ejection of the meal at the circumference of the stones. Both upper and lower stones were grooved in the same way, the grooves being arranged in groups of parallel lines placed more or less tangentially to the central perforation (FIG. 42). Thus when the upper stone was revolving the grooves on the opposing faces would be continually cutting across one another and catching the grains of corn between them, as between the blades of scissors. The same movement would tend to push the meal down the grooves towards the periphery of the quern, but this latter function is of secondary importance, as the earliest grooved querns had such sloping surfaces that the meal must have had little difficulty in escaping. It is perhaps to this feature that Virgil's *lapis incusus* refers,<sup>17</sup> and if so it goes back at least to the first century B.C. in Italy. In Britain grooving was probably commoner in the towns and villas than in the villages, no doubt because a grooved quern cost more than the average peasant could afford. We suspect also that it may have been commoner in the second half of the Roman period than the first, though the earliest specimen that the writer has noted is a fragment of a quern of the early Romano-British form described above, found with late La Tène III pottery in Maidstone, and preserved in the Maidstone Museum. This piece is of lava, and is therefore imported ; its grinding surface slopes at about 14 degrees.

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<sup>14</sup> Arthur Mitchell, *The Past in the Present*† (1880), 35-7.

<sup>15</sup> Glastonbury Museum, Q 8 (W. 8).

<sup>16</sup> Columella, *R.R.*, XII, 50.

<sup>17</sup> *Georgics*, I, 275.

## ANTIQUITY

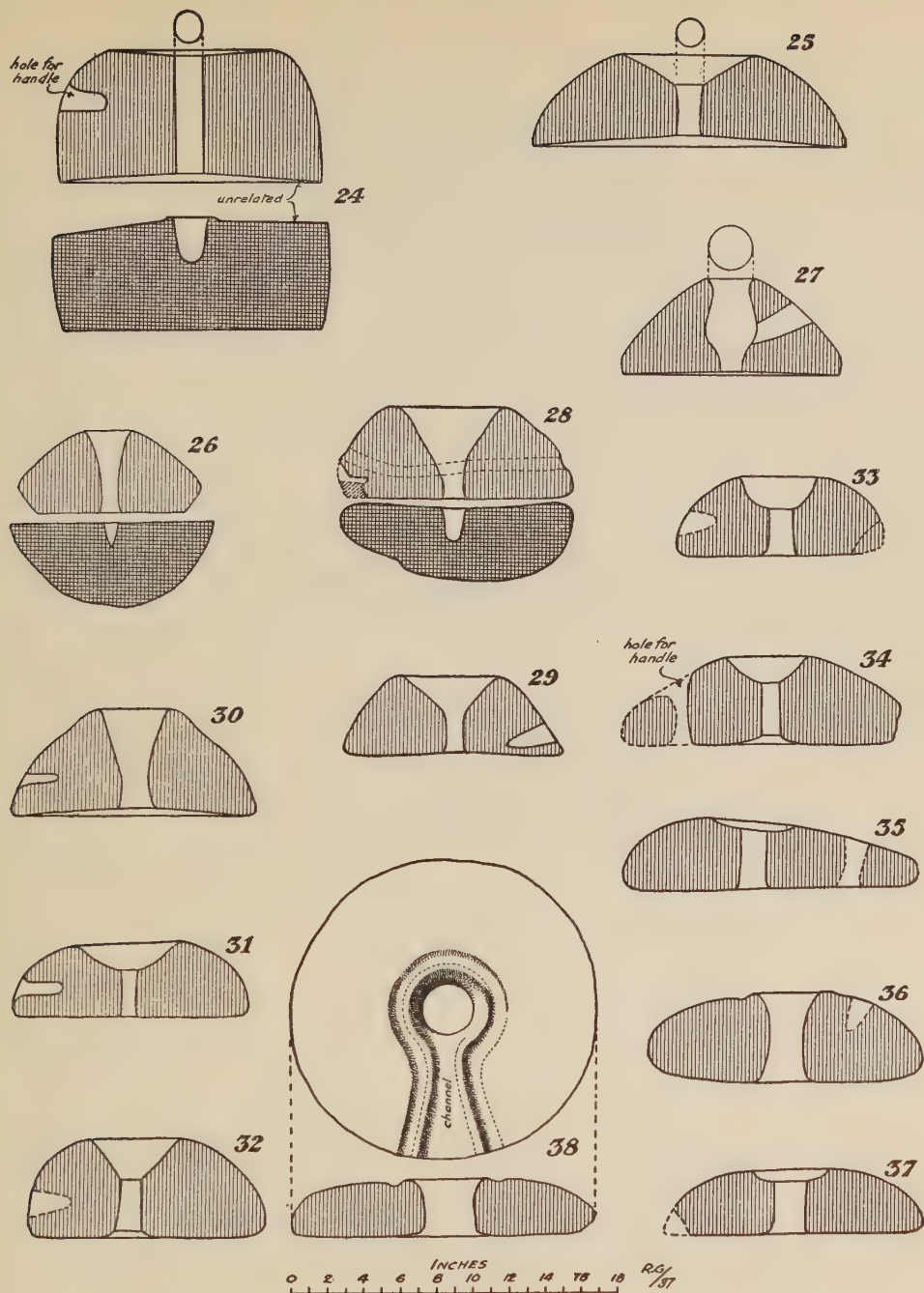
(3) FLAT TYPES. It may possibly be that the increased facility with which grooved querns ejected the meal made possible the reduction of the slope of the grinding-surfaces until they ultimately became practically flat. Flat querns, that is, those in which the slope of the grinding-surfaces does not exceed 2 or 3 degrees, are of more than one type.

(a) *Disc type : late or post-Roman* (FIGS. 22, 23). First, there are those which appear to be derived from the types which we have been describing, and which are probably late Roman in date. These consist essentially of two thin discs of stone, both with central perforations, while the upper sometimes has a kind of collar round the aperture, reminiscent of the hopper. In these the handle-hole, if present, is necessarily on the upper surface, and points to the use of a vertical wooden handle, thus contrasting with the pre-Roman querns. Part of a lower stone of a grooved quern of this type was found at Pevensey, where it must date to the 4th century. The grinding surface slopes at 3 degrees, and there is a central perforation ; the slight concavity of the under-surface proclaims its descent from the late Romano-British quern already described (FIG. 22). This type of flat quern has, with minor variations, a wide range of date, from the example found in one of the re-occupation pits at Cissbury (FIG. 23), to which allusion was made at the opening of this paper, to medieval and perhaps modern times. The precise date of the Cissbury quern is still a puzzle, but there seems nothing against a possible date in the Dark Ages, even if it is not late Roman, for typologically it should be later than our late Romano-British type. These flat querns may or may not be grooved, for as we believe that grooving may have made the flattening of the grinding-surfaces practicable, so we suggest that the un-grooved flat quern may have arisen as a cheaper and less efficient imitation. The poverty of the prospective owner has always been a powerful factor in influencing the development of the quern, as of other contrivances. On the other hand, the development of this type of flat quern may have been influenced by the second type, described below, which arose independently of grooving. The introduction of wind and water-mills during the Middle Ages, and the repressive laws against hand-mills,<sup>18</sup> combined to retard the development of the quern in England since the Norman Conquest. The medieval English quern is likely to have been profoundly influenced by types introduced by the Saxons (see under

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<sup>18</sup> Bennett and Elton, *op. cit.*, I, 210-21.





# ROMAN LEGIONARY QUERNS (?) AND THEIR SCOTTISH DERIVATIVES

- Fig. 24. Ham Hill, Somerset; Iron Age B (Taunton M.)  
 Fig. 25. Richborough  
 Fig. 26. Provenance unknown (Maidstone M.)  
 Fig. 27. Hardham *mansio*, Sussex (A.D. 50-150) (Lewes M.)  
 Figs. 28, 29. Randylands Mile-Castle, Cumberland (2nd cent. A.D.). (Carlisle M.). Grinding surfaces grooved  
 Fig. 30. Newstead Fort, Roxburghshire (late 1st or mid-2nd cent.)  
 Figs. 31, 32. Castlecary Fort, Stirlingshire (late 1st or mid-2nd cent.)  
 Fig. 33. Barlockhart Loch Crannog, Kirkcudbrightshire  
 Figs. 34, 36, 37. Cinn Trolle Broch, Sutherland  
 Fig. 35. Broch of Burray, Orkney  
 Fig. 38. Lamaness Broch, Sanday, Orkney  
 (Figs. 29-37: Edinburgh M.)  
 Lower stones are cross-hatched

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'Pot-Querns', below). Hand-mills were used in Cumberland as late as the early part of the nineteenth century.<sup>19</sup>

(b) *Flat 'Beehive' (Roman legionary type?) and its Scottish derivatives* (FIGS. 24-38). There is a second type of flat quern which appears to have been derived from the Hunsbury class of Iron Age B (see p. 142). This is the humped or 'bee-hive' type, of which the upper stone bears a close superficial resemblance to that of the 'bee-hive' querns of the Early Iron Age, except for the fact that the grinding-surface is almost or quite flat. This kind is sometimes made of pudding-stone; the lower stone has a round base and a central socket for the spindle, like the pre-Roman and early Roman specimens. One specimen of pudding-stone, with grinding-surface sloping at only 3 degrees, comes from the excavations at Richborough, but unfortunately has no detailed history of closely datable associations (FIG. 25). Others of similar profile come from the Roman forts at Newstead and Castlecary in Scotland (FIGS. 30-32), where Professor Childe tells the writer that they are probably Flavian or possibly Antonine in date (viz. late first or mid-second century A.D.), and from a mile-castle at Randylands on the Roman Wall (Carlisle Museum), where they were found in a second century stratum (FIGS. 28, 29). Yet another specimen comes from the crannog in Barlockhart Loch (FIG. 33).<sup>20</sup> These have lateral handle-sockets, like the pre-Roman querns, and an important feature of this type is the rarity of grooving. On the slight evidence available these querns should belong to the first and second centuries A.D. They certainly occur more commonly in military areas, and seem to be almost unknown in the peasant settlements of the south.

The querns from the Scottish *brochs*, dated from the first to the fifth century A.D.<sup>21</sup>, appear to be barbaric derivatives of this humped type of flat quern, and seem to undergo a progressive thinning, while the handle-socket travels up the curved profile of the upper stone to occupy a more or less vertical position on the top (FIGS. 34-38). Sometimes the handle-socket completely perforates the upper stone, the lower end opening on to the grinding-surface. The basin-like hopper is reduced to a vestigial depression, or vanishes altogether, its place being sometimes taken by a slightly raised collar round the opening (FIG. 38). But in every case the grinding-surfaces are practically flat,

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<sup>19</sup> *Ibid.*, 171.

<sup>20</sup> I am indebted to Professor Gordon Childe for this information.

<sup>21</sup> For an account of the *brochs* see ANTIQUITY, 1927, I, 290-8.



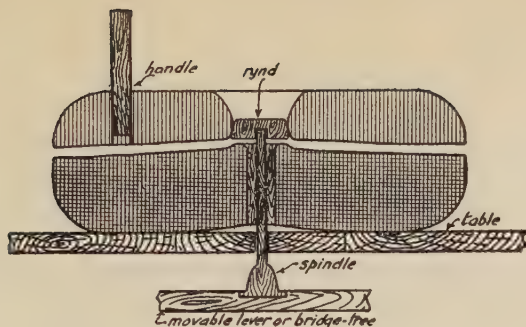
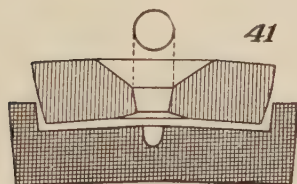
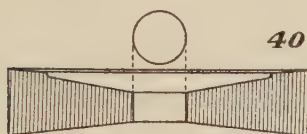


FIG. 39. MODERN SCOTTISH QUERN, N. UIST  
To show method of adjustment for grinding fine or coarse meal  
(Compare plate III)



#### QUERN-TYPES MADE OF LAVA

Fig. 40. Richborough; fine grooving on all surfaces

Fig. 41. Pot-quern, Winchester; said to be Saxon (Winchester M.)



FIG. 42. DIAGRAM TO SHOW PATTERN OF GROOVING  
Often the grooving on querns is more closely set and tends to be more radially disposed

## ANTIQUITY

thus differing from the contemporary Romano-British querns of normal types from southern Britain, and grooving is absent.

It looks as if the modern Scottish flat querns (FIG. 39) have been developed from the beehive type by a process of thinning, for they seem to be directly descended from those of the brochs. They have the vertical handle, and are inclined to be asymmetrical, but they exhibit the perforation of the lower stone designed to facilitate the adjustment of the upper stone, as has already been described, and it is, in fact, by observing these modern querns in actual use that the purpose of the perforated lower stone has been understood.

(4) POT QUERNS. A pot-quern is one in which the upper stone revolves inside a hollow cylindrical lower stone. The grinding surfaces are more or less flat, and are generally grooved, but in addition the exterior cylindrical surface of the upper stone has been 'trued' and shows signs of wear resulting from friction against the sides of the pot-like lower stone. The latter has a socket for the spindle, and is not usually completely perforated. There are commonly more than one handle-socket on the top of the upper stone (FIG. 41).

The writer knows of no evidence that any specimen of a pot-quern is necessarily of Roman date. The type was very familiar in the Middle Ages, and a specimen from Winchester, made of lava, and said to have been found in a Saxon horizon, is in the Winchester Museum. Typologically this kind of quern does not fit into series with what we know of Romano-British querns, for while the flattish, grooved grinding surfaces should be late, the spindle-socket should be early, and innovations like the pot-form and the twin handles appear suddenly and without much reason. One would venture to suggest tentatively that it may be a form that was introduced by the Saxons, but this can only be verified or disproved by careful observation of datable examples in this country, and especially by study on the Continent. The frequent use of lava of German origin would be quite in keeping with this suggestion, and, in fact, most querns made of lava seem to be of forms that differ more or less from those that are normal in Britain, thus suggesting that they may be German types. Some of these were, of course, introduced during the Roman period (FIG. 40).<sup>22</sup>

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<sup>22</sup> Two pieces of Niedermendig lava were found by Mr Alexander Keiller with Neolithic B pottery in the excavations at the Avebury Avenue, Wilts. (ANTIQUITY, 1936, x, 422). Mr Stuart Piggott tells me that one of these has a smoothed face, suggesting that it formed part of a grain-rubber or saddle-quern. Another piece of similar material was found by Mrs Cunnington in an Early Bronze Age context at 'The Sanctuary', Overton Hill, Wilts. (*Wilts. Arch. Mag.*, XLV, 322).

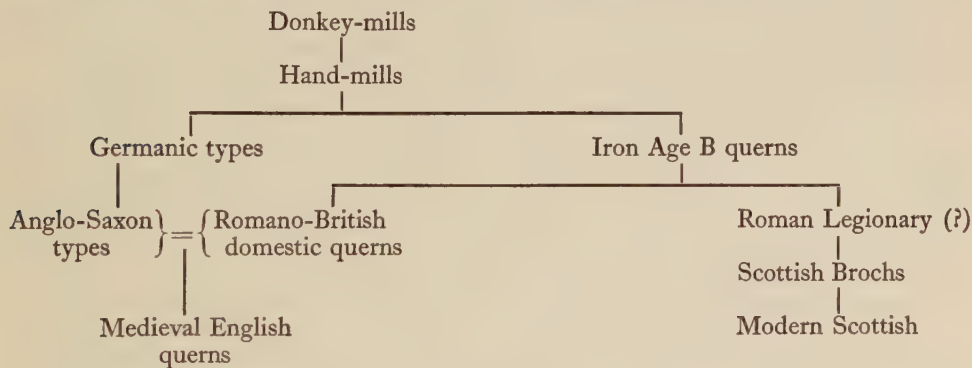


# QUERNS

## CONCLUSIONS

The development of the quern presents an immense field for study, and represents a gap in our knowledge which is crying out to be filled. What has been said above is designed to stimulate research by suggesting a rough classification of some leading types in Britain only. These need checking, correcting and amplifying, and the whole of the Continental and Irish material needs studying, in order to place our own in its proper setting. With the exception of lava, questions regarding the varieties of stone used for querns have not been raised, as local materials do not appear to have influenced their development. Still less has any attempt been made to include every known variety of quern, as many local developments are likely to have taken place. In fact, it is probable that local styles have not been sufficiently taken into account in what has been said in this paper.

Our tentative scheme for the development of British rotary querns may be summarized in the form of a genealogical table :—



The writer wishes to acknowledge the kindness of all who have helped him, by giving access to querns in Museums, and especially by supplying information and scale drawings. Among many such benefactors he would specially mention Professor V. Gordon Childe of Edinburgh, Mr Robert Hogg of Carlisle Museum, and the writer's uncle, Mr H. B. Curwen, for the use of the photographs he took in the island of Foula in 1902.

# The Method of Prehistoric Archaeology

by A. M. TALLGREN

*Professor of Prehistoric Archaeology at the University of Helsinki, Finland<sup>1</sup>*

**D**URING the last fifty years prehistoric archaeology has developed with extraordinary rapidity into a firmly established branch of science. A system has been constructed, the frontiers of several cultural phenomena have been laid down, and the outlines of prehistoric chronology have been formed. Hypotheses and assertions have been made concerning the ethnographical groups of prehistoric times, and lengthy 'prehistoric' periods have literally been transformed into 'historic' ones. The inscription on the medal struck for Oscar Montelius—'Fifty years of research have mastered millennia of human culture'—may serve as a short motto summarizing the results of archaeology as a whole, not merely the achievements of one man.

The method which has led to this result is that of the empiric sciences, based on the theory of evolution, namely, that of typology. The starting-point of research has for the most part been morphology. When synthesis has been the objective, the student's instruments of research have consisted primarily of *forms* or *shapes* of objects, or ornaments and tombs and so forth, and their comparison.

Such in general has been the archaeologist's method of research; he has tried first of all to become acquainted with all the available material, such as objects and ancient monuments, within his field of action and on the frontiers of his region. He has arranged it both vertically, in chronological groups, and horizontally, in culture-circles, taking into account the similarities and differences in the material culture of adjacent regions. To fix the chronology, associated finds are of basic importance—hoards, and closed tomb-groups as well as superimposed cultural deposits and stratigraphy. For cultural synthesis there are distribution-maps, implying cultural geography.

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<sup>1</sup> This article was first published, in French, in Professor Tallgren's journal, *Eurasia Septentrionalis Antiqua*, vol. x, 1936. The English translation has been revised by Professor Tallgren, whom we wish to thank for his permission to print it. In the same volume is another article, in English, giving an account of the author's recent tour in the USSR, and the impressions received there.



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In such a way, for example, has been determined the 'colour' or history of the Bronze Age of Northern Asia, with its three different cultural provinces: the Taïga or forest region of Siberia, the Steppes of Minoussinsk and those of Kazakstan. These last two provinces are closely connected, and are in their turn related in certain respects to the culture-circles of the Black Sea steppes. But west of those steppes are found objects whose nearest analogues occur, some on Hungarian soil, some in the Caucasus, some on the Kama river, and so forth. This region, therefore, then becomes itself a yet larger unit. As for the Taïga of Northern Siberia, it approaches most closely in character to the culture-circle of the Kama river, west of the Urals. To draw conclusions from absolute chronology one would have recourse to imported objects and stratigraphy, that is, to the deposits in which key-finds occur.

After this preliminary work of analysis, the student would try and achieve a synthetic definition of his province, primarily upon a basis of commercial relations, cultural environment, phases of history and ethnography. As has been pointed out above, also at this synthetic stage of enquiry it is *morphology* which is the student's most valuable instrument of research. Certain archaeologists work mainly with materials of a precise and limited kind—brooches, pottery and ornaments are the first choice; others make use of forms in their totality, not merely a few phenomena, of a culture in its entirety. Their basis is wider and perhaps also more firm, but the synthesis is more liable to acquire a subjective colouring—though this danger is reduced in the case of really competent students. The somewhat accidental and one-sided nature of the material—wooden objects, woven materials and colours being almost entirely absent—naturally tends to weaken the evidence and the cultural conclusions, but it does not invalidate the method.

In operating thus with forms archaeology is not alone. It is the method of operation adopted by material ethnography and—*mutatis mutandis*, substituting for the forms of objects, other human products such as words, tales, songs, for instance—by historical philology, ethnology, the study of folk-lore, in fact by quite a large group of modern historical sciences. In philology it is loan-words which are the most useful 'fossils'. In reaching their conclusions, the leading philologists take into account the whole vocabulary, the character of the phonèmes, of morphology and of syntax—in a word of that whole which corresponds in archaeology to the cultural whole.

To a certain extent scientists have assumed that the method adopted

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by students of the humanities was as certain and as rigidly exact as that of natural science. The great achievements of positivism, of Darwinism, have been transferred to the humanities, and the course of *evolution*, made subservient to the *laws* (with emphasis on these two terms) observed in history, has brought the latter, as has been thought, to the same degree of exactness as the natural sciences, to the satisfaction of the students of humanities.

But is the formalist method correct when it is applied to the humanities? No, I do not think it is, and probably most archaeologists, who are of the same opinion, are sceptical. Scepticism is a powerful aid to scientific thought. Above all scepticism is justified in the case of creative scientists and is as indispensable as positive knowledge. One must be bold enough to cast doubt both upon the theories of others and upon one's own, and even upon the foundations of one's own science and its method, if one is to achieve a criticism that is not barren but alive. And scepticism is positive if it leads to a knowledge of the limitations of one's field of science, to the suppression of vanity and self-conceit, to an appreciation of realities.

At any rate it appears that archaeology, in spite of its remarkable achievements, has got into a cul-de-sac.<sup>2</sup> On the one hand public interest in our science has enormously increased—in educated circles abroad archaeology is one of the most highly appreciated subjects ;<sup>3</sup> and excavation continually brings to light new and admirable material especially in the ancient East and in Northern Asia ; on the other hand however, the savant himself shows signs of hesitation, a certain lack of faith and courage, at any rate when he has to teach in a University. The problems are too easy ; one might say that the savant was no more than a master-craftsman. The whole subject consists merely of a comparison of forms and of systematization. The chief object has been to elucidate the prehistory of assumed ethnic groups and their cultural relations—in so far as the investigator does not limit himself to a mere examination of types, to classification and chronology, that is, to analysis without an attempt at synthesis, as too often happens. Brilliant systematization, regarded as exact, has not led and does not lead to an elucidation of the organic structure of the whole life of the period studied, to an understanding of social systems, of economic and social

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<sup>2</sup> cf. the publications of the Russian Academy for History of Material Culture, viz. *Soóbshcheniya* 1931, 1932 : *Problemy* 1933.

<sup>3</sup> cf. *The Illustrated London News*, which has for many years given authoritative and original reports on current work and excavations.



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history, to the history of religious ideas. In short, forms and types, that is, products, have been regarded as more real and alive than the society which created them and whose needs determined these manifestations of life.

Criticism of the existing method of archaeology has been strongly reinforced during the last few years, though up to now no exchange of ideas has resulted. That is because the point of departure is partly political ; that is so in Russia and Germany, both of them countries in which archaeology is used as an important political weapon in the service of ideology in home and foreign policy. To criticism that is strictly scientific and unimpassioned one should adopt an attitude that is dignified and proper ; and one must therefore treat even tendentious criticism objectively and calmly. Have we reached a crisis where the procedure and aims of our science must be revised ? Have the results hitherto obtained become obsolete ? Have we perhaps been pursuing a will-o'-the-wisp which gives neither light nor warmth, which has gone out because it had no real existence ? Or may the work accomplished up to now be of some use, even if it does not constitute the trunk of the tree whose top we are trying to reach ?

### II

An undeniable weakness of prehistoric archaeology—perhaps also of other kindred intellectual sciences, and one we have possibly been heedless or unaware of—is the stereotyped attitude adopted towards historical and cultural phenomena. No state of culture, no evolutionary stage is or ever has been uniform ; there have always been differences. In every culture one discovers rudiments, survivals, archaisms, marginal features, whatever word one may employ. These phenomena exist side by side, often for a long time, and exert a lateral influence on the forms which have developed later ; in no country has there ever been a really uniform rate of evolution or cultural history. The ‘reconstruction’ of a given culture-period is a purely theoretical affair ; in every stage of culture there are ‘dialects’, if I may use a philological metaphor,<sup>4</sup> even in the earliest stages. Any reconstruction of a given culture which disregards ‘dialects’ may lead to serious errors. It is easy to see this in the case, *e.g.*, of Austria-Hungary about 1914. On the one hand there is the centre, Vienna, with its brilliant forms of expression extending right into Bosnia ; but on the other is the living

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<sup>4</sup> As do the Russians, quite correctly in my opinion.

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Bosnian culture, quite different, with a wealth of fine gradations. What a mistake it would be three thousand years hence to infer a uniform Austro-Danubian culture on the basis of stone houses, churches, schools, industrial products, that is, on the basis of the standardized products of life, neglecting the 'dialects', that is, life itself with all its variety? If one were to compose a picture of Bosnia today relying only upon the Viennese phenomena encountered there, one would give an absolutely false impression. It would be a fault not merely in the application of a method but in the method itself. The forms of life in each culture-circle are always multiple, however much one may imagine that progress, 'that which happens', depends upon the leaders, upon individuals and not upon the broad masses.

Another obvious weakness of prehistoric archaeology and one to which philology also is specially susceptible (although it was philology that first began it), is the tendency to see, first, a uniform population or ethnic group behind cultural phenomena, that is, behind the forms of material culture; we have also been too apt to see, in cultural connexions and particularly in cultural transmissions, the movements and migrations of *peoples* instead rather of the products of different social classes and of commerce. That material culture often cannot be equated with a 'people' is proved, for example, by Northwest Siberia at the present day. The material culture of the Vogulians, represented only by some 5000 persons, is divided into two entirely different groups dependent upon the trade and occupations followed. On the other hand, on the basis of material culture it is difficult to regard the Vogulians and Ostiaks as distinct groups of two different peoples, even if one takes into account such essentially national characteristics as their ornaments. Furthermore, in a part of the culture of the Samoyeds, who are not related to them, an obvious identity with that of the Vogulians and Ostiaks of the Ob has been observed; so that we must draw the following conclusion:—even when the economic structure and geographical environment are identical and are associated with the same mode of living, it is evident, in the case of a well-studied living material culture, that 'nationality', 'people', 'ethnic group', does not always impress its mark on the products of material culture and hardly even upon those of intellectual culture. A uniform culture may exist quite independent of ethnographic frontiers. The same phenomenon can be observed also on the steppes, not only in the Arctic regions; amongst the motley prehistoric settlements of the Eurasian steppes, the remains of say the second half of the first



## THE METHOD OF PREHISTORIC ARCHAEOLOGY

millennium B.C. do not enable us to determine national territories, nor even to delimit the frontiers between peoples actually as different from each other as Turks and Iranians. There are geographic and cultural groups which are not ethnographic.

The facts of historical epochs show too that the material culture of a given epoch cannot be identified with a nationality. A classic example is provided by the rococo style of the eighteenth century; if, so far as France and Germany are concerned, we had no remains of this epoch except the material objects and ornaments, it might happen that a student studying the archaeology of the settlements would define a 'national' territory, of course with local variations, extending without a break from the coasts of France to the east of Berlin, perhaps as far as Warsaw. To decide what is 'national' by means of material culture, whether it be archaeological, ethnographic or historical, is to overestimate the power of science and in fact leads into error. Amongst other factors one must not underestimate the importance of fashion and of industrial commerce.

The 'people' itself is not homogeneous in composition, not even in the historical sense. Under such conditions it is not even ideologically correct to try and find the 'people' by means of material culture. The 'people' is a product of history, not of nature, and far less of race. Its distinctive marks are language, which in truth is not always native to it, and above all popular<sup>5</sup> religion, that is to say, beliefs and ritual. The higher the state of evolution and the more important the role played by language, the more often do we find in certain selected individuals—but not in the bulk of the population—a creative element whose expression, in the regions of the mind and perhaps also in those of matter, may take the form of 'nationality'.

As for the migrations of peoples, which have certainly taken place, obviously they have usually been of such a kind that the existing inhabitants have not been annihilated by the newcomers. The invaders are often numerically far inferior, but they may have a decisive influence in the birth of the new material culture. Further, it is always necessary to find out whether the invaders belong to a nomadic people or to a warrior class, whether their culture was really their own or

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<sup>5</sup> When he asked the Vogulians in Siberia about their ethnic relation to the Samoyeds and Zyrians, Professor A. Kannisto of Finland got a very characteristic reply: the first two tribes form an 'ethnographic unit' ('their religion is common to both, but each has its own language'); but the Zyrians are foreigners—they are Christians, 'that is to say, Russians'.

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whether it was borrowed, what stages of cultural development were represented by the old population and by the newcomers respectively. In regard to the products of material culture an exaggerated importance has been attributed to 'nationality'. The scientists of every country have erred in this respect, especially the Germans who often confuse the idea of a cultural with that of a national province, failing to examine its character in each individual instance. National 'colour' is hardly ever primary in cultural products.

There were undoubtedly ethnographic provinces in prehistoric Europe. It is easiest to distinguish the latest, protohistoric, ones, with the help of facts and documents of a historical and philological nature, or by means of the study of place-names. One can do this, for example, for the Celtic and Germanic groupings at the beginning of the Roman period. The remarks set down here apply above all to the preceding prehistoric periods, when it is impossible to throw any light on the nationality of the population by means of the relics of their material culture. In the primitive archaeological remains of Europe, it is exceptional to find any indications of nationality, except in the case of a highly differentiated insular culture.

### III

In consequence of the errors into which archaeology has fallen through the systematization of material culture, that is to say, by formalist study and by the investigations of ethnography, and in general by its formalist empirical methods, there has arisen a strong demand for a modification of the whole character and method of archaeology. This claim is justified, I think, so far as the starting-point and synthesis are concerned, but only in part as regards the treatment of material. Archaeology should cease to be a 'natural science', founded upon the study of objects and forms, and should become an economic-social, historical science. As a starting-point one should take the elucidation of the economic system, of the economic and social *basis*, of which the objects are manifestations. To the extent to which the student relies upon material culture, the essential material will consist of such objects as play a decisive part in the genesis of the culture-stage; not ornaments but the instruments of production—implements, *necessary* things; in regard to such it is their *function* which is decisive, not their *form* or analogies. In this last instance one does it violence by separating the object from the system of production of which it is the instrument and from its economic environment. One should no longer deal with



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it in isolation but rather in association with its group or complex ; thus, for instance, not only the sickle but also the hoe, hammer-stones, pots, the whole organic body of the craftsman's equipment.<sup>6</sup> Or again, to take an example from the steppe peoples, not only horse-trappings but also the horse as a warrior's charger : the saddle, the stirrups, the arms (sabre, dirk, shield), perhaps the bearer of the shield and his equipment.<sup>7</sup> It is surprising how much nearer one gets to life by this method of approach than by a study of forms, how the way opens out in front of the enquirer, how the sense of frustration, of reaching a cul-de-sac, disappears entirely. I am sure that philology will find the same thing when it thus liberates itself. I think that philology and archaeology, which are now so dry and whose vitalizing points of contact are so few, will broaden out to the mutual advantage of both, and navigate their allied craft out into the open waters. Use and function, not form—that is the starting-point of research.

Archaeology is now beginning to take much more interest in the motley and many-sided aspects of life. The whole mechanism concealed behind phenomena is a complex ; the men of ancient times were not just 'scientific specimens' ; a cultural region by no means always coincides with that of a single people, nor is its frontier a national frontier. The economic state of the population is and has been a decisive factor ; the presence or absence of social classes, specialization of profession, craftsmanship or home industry. The economic system as a whole was of more significance than nationality. In the same way, slavery, feudalism, foreign trade, trade conditions—all such are of more importance than the supposed 'evolution' of local types of implements and tools which very often never occurred at all. One and the same ethnographic region contains within itself both rich and poor, nucleations and marginal areas, cultural 'dialects'. Therefore I regard culture as a human product and not as a natural product. It is a social product and it should be studied as such.<sup>8</sup> Historical science is not an exact science.

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<sup>6</sup> Holmsten, *Problems of the Russian Academy, etc.*, 1932, no. 11-12.

<sup>7</sup> Holmsten, *op. cit.*

<sup>8</sup> Latterly the importance of these conditions and of economics in the study of prehistoric cultures has been frequently emphasized in the archaeological literature of Northern Europe. In this new orientation the many excellent syntheses of A. W. Brøgger dealing with Norwegian archaeology are models of their kind. Professor H. Moora, of Tartu, amongst others, is working on the same lines. In Britain, Crawford (in *Man and his Past*, 1921) foreshadowed the approach of a synthetic study of cultures,

[continued on next page]

## ANTIQUITY

This is not the place to deal with every aspect of the subject. My criticism of formal research has been set forth and substantiated, and one may proceed to resume upon a fresh basis the examination of many archaeological problems. But one must not set out to destroy the old science, as was done, for example, in Russia, the land of the Revolution. It is agreed that there co-exist both marginal areas and centres, evolved forms and survivals ; progress, we say it again, is usually achieved at the centre and by a population capable of evolving. The existing chronological tables and type-classifications, the great analytical achievements of the archaeologists of the last century are not, in these circumstances, pure theory or merely a game ; they correspond to a partial reality, to the extent that they represent the cultural phenomena of a definite epoch. From them proceed the new forms, determining the future culture, although the old 'types' may still survive in marginal areas. The Renaissance, for instance, is a true short culture-period, even though its derivatives are still to be seen some two hundred years later (in Sweden for instance) than elsewhere. If I may be allowed the simile, it is as if fathers and grandfathers, uncles, aunts and cousins continued to live in the same region together with all their different culture-products, and not only the direct descendants of the main genealogical line. Different cultures co-exist in a culture-circle, though they are not of equal importance in the history of humanity. It is not only over-generalization and schematism that are dangerous to science, but also the negation of phenomena.

In this article I have said that scepticism is the most effective test of research, and one of the most important factors in its advancement. Dogmatism and canons are not proper to science ; they are just as reprehensible in social science—as one may observe in the USSR—as in theology. It is proper to emphasize this fact in view of the archaeological exaggerations current in the USSR and the racial dogmatism of Germany today. The 'archaeology' of these two States is in our days sometimes, but of course not always, mere dogmatism, scholasticism, deriving its proofs, even in the form of verbal

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*continued from previous page*

which would attempt to reconstruct the economic conditions of a society by means of its material products and by restoring its natural environment. To do this has been the aim of the best British excavators in recent years, as their reports indicate. In general archaeology this view-point is perhaps most conspicuous in the works of Professor Gordon Childe, particularly in his last, fully reviewed in *ANTIQUITY*, December 1936. 'Typology' and pure formalism are in fact already becoming rare almost everywhere.



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quotations, from the works of political authorities or from the speeches, dogmas and assertions of many leading statesmen. *Vanitas vanitatum* ! It is useless to engage in controversy with them. Enough to quote Merejkowski's remarks on the same phenomenon, from his essay on Don Quixote : ' The misfortune of the whole civilization [of the period] was that it was a lifeless scholastic system ; it lacked the vitalizing qualities of science—experiment, a sceptical attitude, criticism. Authority, no matter whether it be the Bible or Aristotle, the Æcumenical Councils or Averroës, at any rate authority—that is, a force external and foreign to science—excludes all liberty and independence of thought, exacts an absolute obedience and compliance . . . substitutes a blind faith for unfettered research, imitation for originality, submission to external authority for freedom of thought . . . and signifies the death of science, whatever may be the political label borne by authority '.

The aim of archaeology is unquestionably to elucidate the cultural, social, economic and intellectual conditions during the long periods for which historical documents are not available. But we must not strive to attain it prematurely or dogmatically, without a rigid analysis of the material, without classifying and systematizing it. Unfortunately this necessity is not sufficiently realized, *e.g.* in the USSR where much useful research work has been done, but where in pursuance of the Marxist theory, every ancient culture is examined for traces of ' stages ' illustrating the doctrine of a social evolution from matriarchy to patriarchy and feudalism, as well as from totemism to agricultural divinities—an evolution which has certainly not taken place in every region and period.

The criticism whose legitimate aspects I have examined has undoubtedly succeeded in proving that a considerable portion of the achievements of archaeology is obsolete, but not the greater portion ; excavations, museum collections, descriptive catalogues remain, and so also do the lexicons, comparative dictionaries and grammars of the philologists. But we must give up the attempt to achieve precision, and be content with life ; we must give up too the treatment of forms as if they were links in an assumed typological evolution ; it is use and practice which determine the forms of things. By taking as the starting-point of research the economic basis and the structure of that life of which archaeological finds are the evidence, morphology, chronology, geography and stratigraphy remain valuable instruments of scientific investigation.

# Dwelling-houses in Jutland in the Iron Age

by GUDMUND HATT

FOR natural reasons it is somewhat difficult to find remnants of prehistoric dwellings in Denmark. Our early forefathers utilized perishable materials in their house building, such as wood and straw. They made use also of clay and sod and, to a small extent, of natural stones. However, Denmark is one of the most intensely cultivated lands of Europe. The plough has been almost everywhere; and when the ploughshare has gone through the remnants of a hut of sod and clay the site is generally spoilt for the archaeologist. As a rule, we cannot expect to find any house-site intact unless it has been covered with a layer of soil, sufficient for protection against the plough.

While our knowledge of the prehistoric dwellings is, on the whole, very incomplete, we know something about the dwellings of the Iron Age for the cultural deposits are comparatively thick. It was probably not until the Early Iron Age—*i.e.* the La Tène and Roman periods—that agriculture reached such a stage of development that successive generations might dwell on the same site. Our best finds are from the northern part of Jutland. In Thy and Himmerland there are a number of deposits of Roman and the pre-Roman Iron Age with a depth of 1–2 m., containing several dwelling-sites above each other. Evidently, there existed in northern Jutland small village-sites, in the Roman period and probably somewhat earlier, of permanent habitation and occupied for several generations.

An example of these village-sites is in the parish of Vestervig in Thy (plan, FIG. 1). Part of a large modern farm, Mariesminde, is seen on the right. These modern buildings are placed on the eastern slope of an oval elevation, about 125 m. long, 75 m. broad and 2 m. high, which consists of accumulations from the Roman Iron Age village. West of the elevation is a hollow, where a clay-pit has been worked in later times. West of the hollow the ground rises again, and here also are remains of the Iron Age village. The total length of the village-site east to west is about 250 m. No traces of the buildings are to be seen upon the surface of the ground. Remains have been found accidentally by farm workers, and systematic excavations last summer revealed a number of house-sites. Three excavations are indicated on the plan. In the western excavation the remains of five houses were uncovered, lying partly above each other. The middle excavation was not very rich in house remains, because it happened to be placed between two rows of houses, a southern and a northern row. On the south of this





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excavation we struck the sides of two houses which had their entrances towards the north ; and on the north side we found the entrance pavement of a house.

The village consisted of two rows of houses, a southern one with entrances facing north, and a northern one with entrances facing south. In the southern row we excavated the remains of five houses, and in the northern row one house. Besides these others were found. Evidently, we have here an example of the long-type village, consisting of two rows of houses facing a street.

We have reason to believe that this type of village was general in northern Jutland in the Iron Age. The site in Tolstrup, near Aars in Himmerland, part of which was excavated in 1927,<sup>1</sup> had a paved street running east and west, separating the houses. The fact that almost all the Iron Age houses excavated in Jutland are long houses, oriented roughly east-west and with entrances in one of the long sides, is in accord with the theory that the Iron Age village of Jutland was a typical long-village.

I would call attention to the tremendous difference in size between the Iron Age huts and a modern farmhouse. Mariesminde, of which only a part is seen on the plan (FIG. 1), is a fantastic palace compared to the wretched huts of the Roman Iron Age.

A plan and section of three of the house-sites in the western excavation are shown in FIG. 2: B and H, resting upon the original surface, are contemporary ; C was built later, upon the remnants of older houses. The houses are very small ; B is barely 6 m. long by 4 m. broad, and H is  $4\frac{1}{2}$  m. by  $3\frac{1}{2}$  m. The floor is made of clay, and continues through the doorway. The walls are of earth, perhaps sod ; but on the inside they were plastered with a thick layer of clay. A few cm. of this wall-plaster was still in position along the edge of the clay floor ; most of it had fallen in however. It was quite easy to distinguish between the wall-plaster and the flooring.

Both houses B and H (FIG. 2) had regular hearths. House B had originally two hearths, one almost rectangular in the east end and one round in the west end, both appearing as hard-burnt parts of the clay floor. At a later period, house B had an oval hearth, also of burnt clay, but decorated. House H had a round hearth of burnt clay resting upon a layer of stones ; originally, the hearth in house H was rectangular and placed a little farther west. Both B and H have had four inner

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<sup>1</sup> Gudmund Hatt, 'Deux trouvailles de stations habitées de l'ancien âge du fer (Mors et Himmerland)'. *Mém de la Soc. Roy. des Antiq. du Nord*, 1928.

## DWELLING-HOUSES IN JUTLAND IN THE IRON AGE

roof-posts. The houses were not burnt, therefore we did not find anything of the posts themselves; but the post-holes are clearly evident in the sand. House H had two door-posts.

House C was not quite as well preserved; part of the northern edge of the floor was disturbed, and I cannot say whether the walls were plastered with clay. Curiously there was no proper fireplace. A large earthen vessel was found buried in the floor. It is not uncommon to find large pots buried in a house-floor; and in several cases I have interpreted them as storage-vessels or water-containers. In this

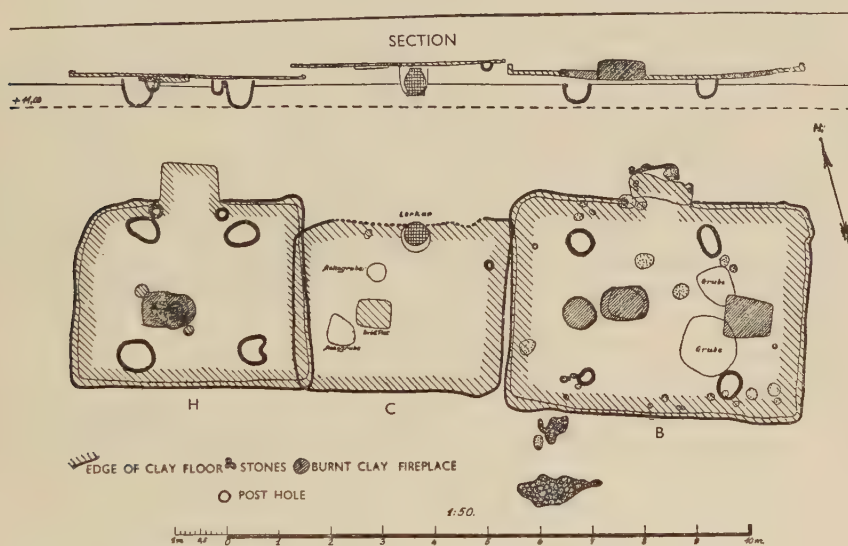


FIG. 2. SECTION AND PLAN OF HOUSE-SITES, VESTERVIG, JUTLAND

particular case, however, the pot was buried upside down and can hardly have served any practical purpose.

House C belongs to the same small and almost rectangular type as B and H. It had probably four roof-posts, although I was not able to locate more than one post-hole.

The later fireplace in house B (FIG. 7) is incised with small squares with rounded corners. The underlying idea may perhaps be the representation of a layer of pebbles—actually, a layer of small stones is very often found in a hearth beneath the burnt clay. This form of decoration has not been found before in Denmark; it has some similarity to a hearth at the Glastonbury village-site.



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A house site (FIG. 3) from the eastern excavation at Mariesminde contained a quantity of charred wood, some of it being oak, probably from the rafters. There were also pieces of worked wood. Near the fireplace were some wooden bars in a frame, probably part of a grate or shelf, placed above the fireplace. The house had four roof-posts around the hearth, all in the western part of the house. In the middle of the clay floor a hearth of hardbaked clay rests upon a layer of stones.

A quantity of potsherds were found on the site and a number of vessels have been reconstructed, many of them with ornament; they date the house to late Roman Iron Age.

House E (FIG. 3) is somewhat later than those already described. It is of more advanced type, and much larger, being 9 m. long and 5 m. broad. The western part of the hut, with clay floor, fireplace and four roof-posts, corresponds to the older and smaller houses, but a simple outhouse was added. A little burnt barley was found.

The small, almost rectangular, type of house with four roof-posts standing around a fireplace is known from the pre-Roman Iron Age. The Trolldoft house<sup>2</sup> is an example—although it differs from the Mariesminde houses by having walls of combustible materials, supported by wall-posts.

Typologically it would seem reasonable to regard the short, almost square house, as relatively old, and the long-type with an outhouse as comparatively late. It must be admitted, however, that the latter did exist in pre-Roman times. The well known Kraghede house, excavated by Th. Thomsen, is of the long-type. The Solbjerg house, where the charred remains of three cows and a horse are evidence that the eastern portion of the long-house was used as a stable, is late pre-Roman.<sup>3</sup> The short-house, with four roof-posts, persisted into the Migration Period. The Fredsø house belongs to this type.<sup>4</sup>

In the long-house at Mariesminde, in the northwest corner, is a clay bench. South of the clay bench and west of the fireplace is a big stone with a basin-shaped hollow in the middle. Stones of that shape have been designated by Danish archaeologists, 'gate-post-stones', and considered as supports for gate- or door-posts. It is quite evident, however, that no door can have existed at the place where this stone is

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<sup>2</sup> Gudmund Hatt 'En Jernalders Hustomt i Trolldoft'. *Aarbøger for Nordisk Oldkyndighed og Historie*, 1935.

<sup>3</sup> Gudmund Hatt, 'Deux trouvailles', p. 189.

<sup>4</sup> Gudmund Hatt, 'Emplacement d'incendie d'une maison de l'âge du fer dans l'île de Mors'. *Mém. de la Soc. Roy. des Antiq. du Nord*, 1932.

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imbedded in the floor. This basin-shaped stone must have had some other use, probably for grinding some kind of foodstuff.

Ten kilometres from Mariesminde is the most famous of Jutland's Iron Age villages, the Ginderup site, where Hans Kjaer in 1922 uncovered a very interesting house, and where the Danish National

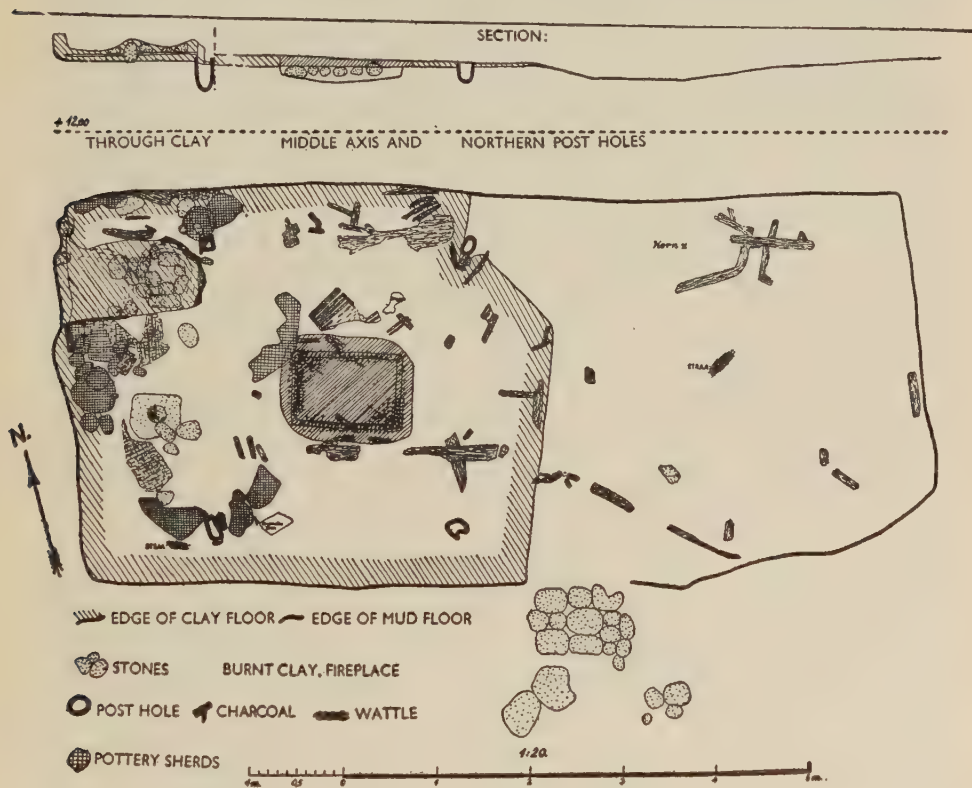


FIG. 3. SECTION AND PLAN OF HOUSE-SITE E, MARIESMINDE, JUTLAND

Museum has carried out excavations.<sup>5</sup> The Ginderup village-site was inhabited through the whole of the Roman Iron Age. The culture-deposit is 2 m. thick, and at one place we found 7 houses above each other. The dating of the Ginderup site is not entirely dependent upon pottery; in 1934 we had the good fortune to find a small hoard

<sup>5</sup> Hans Kjaer in *Congressus Soc. Arch. Balt. Rigae*, 1930, p. 163 ff.; *Proc. Congress of Preh. and Prot. Sciences*, 1932 (Oxford 1934), p. 287 ff.

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of Roman coins concealed in one of the house floors. These coins must have been buried at some time about the year 100 A.D. Below the level of this house three older houses were uncovered ; and in higher levels the remains of three houses were found.<sup>6</sup>

One would naturally expect to find great similarity between the

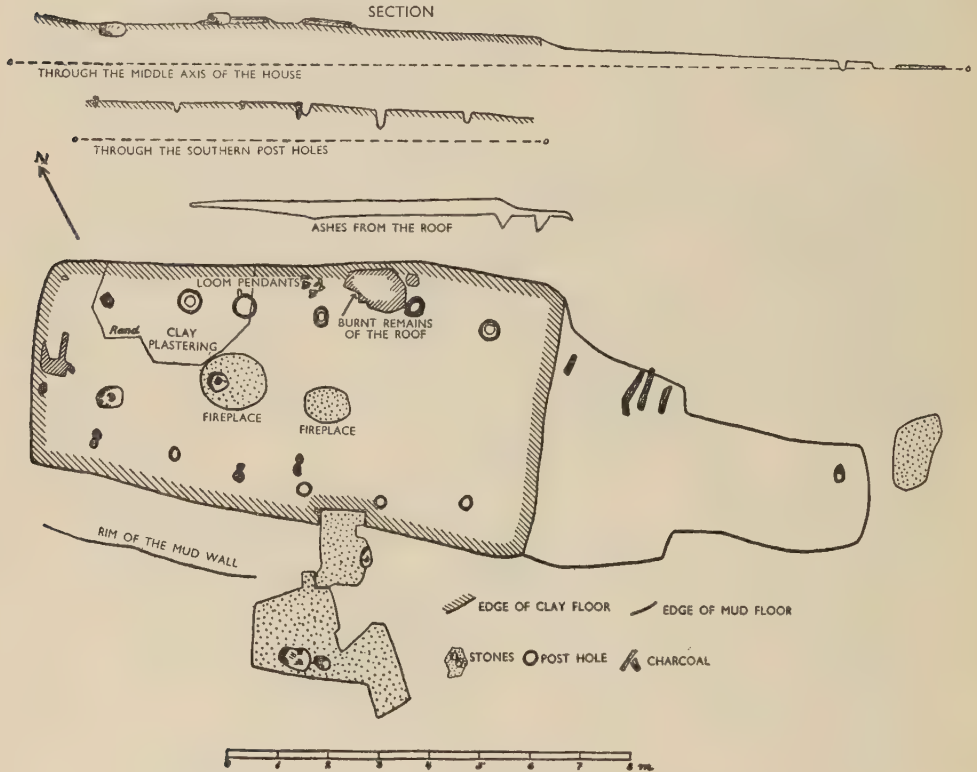


FIG. 4. SECTION AND PLAN OF TYPICAL HOUSE, GINDERUP, JUTLAND

Ginderup and the Mariesminde houses, and it is most apparent in the upper layers. The short-house type with four roof-posts has not been proved at Ginderup. A common feature is the earth or sod wall with clay plaster. But we do not know any Ginderup house with only four roof-posts.

A typical house (FIGS. 4 and 9) 17 m. long and 5 m. broad, consists

<sup>6</sup> Gudmund Hatt, 'Jernaldersbopladsen ved Ginderup i Thy'. Fra Nationalmuseets Arbejdsmark, 1935. *Acta Archaeologica*, 1935, VI, 278-280.



PLATE I



FIG. 7. FIRE-PLACE, HOUSE B, VESTERVIG, JUTLAND. (See p. 165)

PLATE II



FIG. 8. HLARTH, WITH INCISED BORDERS, HOUSE E. MARIEMINDE, JUTLAND. (See p. 166)



PLATE III



FIG. 9 HOUSE SITE, GINDERUP, JU TLAND, SEEN FROM THE WEST. (See p. 168)



PLATE IV



FIG. 10. SUBTERRANEAN STRUCTURE OF A LONG-HOUSE, BAEKMOIEN, JUTLAND,  
SEEN FROM THE NORTH. (See p. 172)

## DWELLING-HOUSES IN JUTLAND IN THE IRON AGE

of a western part with clay floor and an eastern part with mud floor. The western part is evidently the dwelling house and has two fireplaces and twelve roof-posts. The house had been burnt, and stumps of charred wood were still standing in some of the post-holes (FIG. 9). The mud walls were  $1\frac{1}{4}$  m. thick at the bottom. The eastern part was

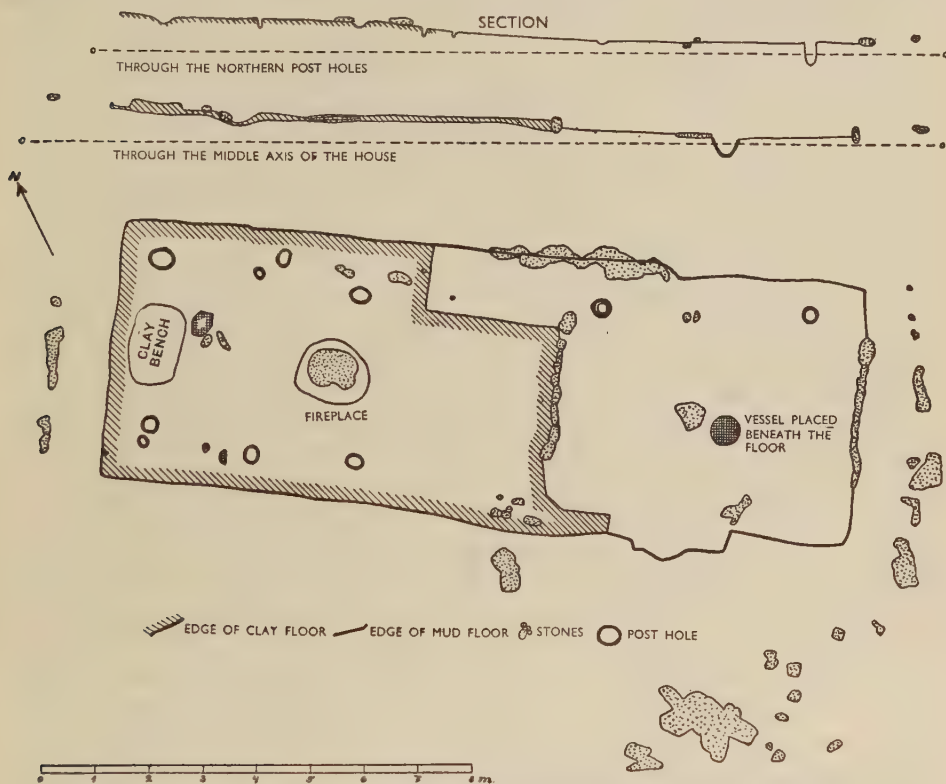


FIG. 5. SECTION AND PLAN OF LONG-TYPE HOUSE, GINDERUP, JUTLAND

an outhouse ; no post-holes were found and probably the rafters rested directly on low mud walls.

In another house (FIG. 5) from the middle layer of the Ginderup village site, the long-type again consists of a western part with clay floor and an eastern part with mud floor. The two rows of roof-supports continued through the whole length of the house, although I was not able to find all the post-holes because the house had not been burnt. The entrance-pavement was dilapidated ; probably some of the

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stones were used elsewhere. The footing of the mud walls was partly lined with stones, inside and outside. A row of stones separated the western part of the house from the eastern part. Near the west wall was a clay bench. In the middle of the eastern part of the house a big pot was buried in the clay floor, probably a water container or a storage vessel.

An attempt at reconstruction (FIG. 6) is shown by a transverse section through a house with mud walls, clay floor, fireplace and inner roof-posts. From actual measurements the thickness of the mud walls varied from 1 to  $1\frac{1}{2}$  m. The height of the walls is estimated from the clay plaster found; there are reasons for assuming that it was between  $1\frac{1}{2}$  and 2 m. high. About the roof we know something; as parts lay upon the floors of burnt houses. It consisted of a layer of natural rafters, upon which was a covering of straw, or in some cases a layer of very thin rods, and this again supported a layer of heather-turf. The slope of the roof was probably not steep or the heather-turf would have slipped off. Further, we know that the roof rested upon two rows of posts, standing inside the house. We do not know how the posts supported the roof, but I suggest that they carried horizontal beams for this purpose. The architect, H. Zangenberg, has claimed—I think, correctly—that the roof must have had some kind of a ridge-beam. As there were no posts in the middle axis of the house, the question of support for the ridge-beam remains. Zangenberg suggests that the posts may have consisted of tree-trunks with one long natural branch, the two rows of trunks supporting on their upper ends two horizontal side-beams, and the crossing ends of the long branches supporting the ridge-beam.<sup>7</sup> This solution seems quite possible, though it may underrate the carpentry of Iron Age house-builders. Natural trunks were in some cases used as roof-posts, but in others, four-sided hewn planks were used for the same purpose, *e.g.* in the long-house at Mariesminde (FIG. 3) Although I reproduce (FIG. 6) Zangenberg's suggestion, I do not regard it as the most likely solution of the problem. In one of the burnt houses on the Ginderup site, I noticed in a mass of charcoal a wooden peg which had been used for holding together two pieces of timber. The technique of housebuilding had probably reached a stage where it was possible to hold a ridge-beam by means of sloping timbers which were in some way supported by horizontal beams, resting upon the roof-posts.

Zangenberg's conception calls to mind Seebohm's and Meitzen's

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<sup>7</sup> H. Zangenberg, 'Gammel Byggeskik'. *Skiveaarbogen*, 1930, XXII, 5-17.



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attempts to reconstruct the Cymric tribal house, based upon the former's interpretation of a description of this building in the 'Ancient laws of Wales'.<sup>8</sup> It should be added, however, that Zangenberg was not acquainted with Seebohm's or Meitzen's reconstructions when he worked out his theory.

Mud walls were in general use in Iron Age houses in the Limfjord region. In some the lower parts were reinforced with stones; this feature is very common in the Himmerland sites, and there also occurs a

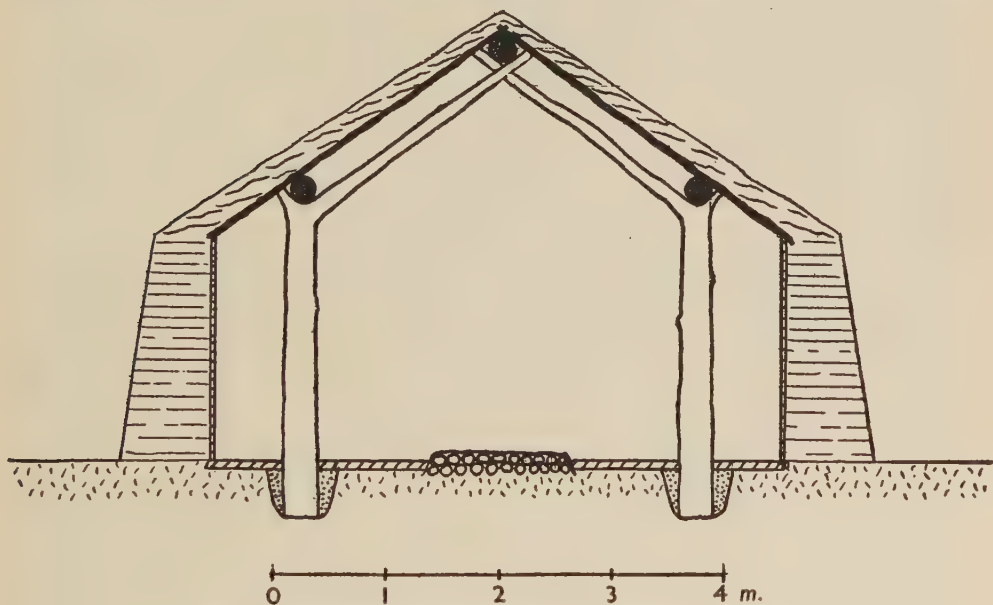


FIG. 6. TRANSVERSE SECTION OF HOUSE, GINDERUP, JUTLAND

special type where the east end of the house is rounded, somewhat sunk into the ground, and set with big stones. This special type is known from the Iron Age site in Tolstrup near Aars,<sup>9</sup> and also from Engelstrup near Løgstør.

In Vendsyssel, on the other hand, wattle and daub walls were used in the Iron Age. Houses of this description are known from Kraghede, and from Rakkeby near Hjørring. The wattle and daub houses seem to have one important feature in common with the mud houses—the

<sup>8</sup> Frederic Seebohm, *The English Village Community*, 2nd ed. 1883, p. 239 ff. August Meitzen, *Siedelung und Agrarwesen der Westgermanen und Ostgermanen*, 1895, I, 195.

<sup>9</sup> Gudmund Hatt, 'Deux trouvailles', p. 204 ff.

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presence of inner roof-posts. The Kraghede house had only four posts, standing around the fireplace in the western part of the house, somewhat similar to the plan of the long-house at Mariesminde. The Rakkeby house, on the other hand, had two rows of roof-posts, six in each row, and corresponds to the Ginderup type.

I refrain from describing the Vendsyssel Iron Age houses, but would like to mention the excavations at Baekmoien, near Frederikshavn, because there was found a cellar-like subterranean structure (FIG. 10) in connexion with a long-house. The house lay as usual about east to west. It had been burnt; and the layer of ashes continued down through the subterranean chamber, which shows that the two were of the same period. The subterranean structure began from the eastern part of the north side of the house, and extended 8 m. north. It was in three parts: a short north-passage, a long south-passage, and in the middle a round chamber, nearly 3 m. in diameter,  $1\frac{1}{4}$  m. deep. The sides of the passages and the chamber are set with big stones.

There is a whole group of these subterranean structures at Baekmoien. I found four, but excavated only two of them. The connexion with a long-house could only be ascertained in one case.

Subterranean structures or 'earth-houses' of this type are known only in a small area near Frederikshavn, and not in any other part of Jutland. Sophus Müller has published<sup>10</sup> some earth-houses from Donbaek near Frederikshavn and compared them to secret cellars and passage ways mentioned in the Icelandic sagas. The fact that these structures are found only in one small area near the coast, and only from late pre-Roman and early Roman Iron Age sites, suggests a foreign influence. Subterranean earth-houses are, of course, well known in Scotland and Ireland. May the idea have come from those countries? It should be added that the method of roofing the subterranean chamber with stone flags by means of a sort of false vault construction is not known in our earth houses. It is, however, known from certain Roman Iron Age graves in northern Jutland.<sup>11</sup>

The long-house, with its two rows of roof supporting posts, has a very wide distribution in Jutland, particularly in the Limfjord regions and in Vendsyssel. Its existence has also been proved in western and southern Jutland. Last spring (1936), with Inspector Raben of

<sup>10</sup> Sophus Müller, 'Vendsyssel-Studier'. *Aarbøger for Nordisk Oldkyndighed og Historie*, 1912, p. 112-124.

<sup>11</sup> J. Brøndsted, 'Ein nordjütisches Steingrab aus römischer Zeit'. *Acta Archaeologica*, 1934, v, 167-175.

## DWELLING-HOUSES IN JUTLAND IN THE IRON AGE

the Sønderberg Museum, I excavated a Roman Iron Age long-house with two rows of inner post-holes in the island of Als.

Though certain local variations occur the Jutland long-house of the Iron Age is a fairly consistent type. It is remarkable that almost all the long-houses excavated in Jutland have the same orientation; their length lies between east-west and southeast-northwest. With very few exceptions the fireplace is in the western half, which evidently was the most important part of the house,

The Jutland long-houses are related to Scandinavian Iron Age houses excavated by Swedish and Norwegian archaeologists.<sup>12</sup> It is generally agreed that the Jutland Iron Age long-houses belong to a large northwest European group. Late forms may still be found inhabited in Iceland and the Faeroes. The shielings and black houses of the Hebrides are probably also late forms of this general group, although they have no inner posts.

As to the wider connexions of this group, I think, with Mårten Stenberger, that they should be sought in Western Europe. Long-houses with inner rows of posts are known from West Germanic and Celtic regions. Evidently this basilica-style existed in some parts of Western Europe prior to the Roman conquest, e.g. in the Netherlands, as is shown by van Giffen's excavations.<sup>13</sup>

There may have been long-houses in Jutland earlier than the Iron Age. As a matter of fact, we know from Winther's excavations at Troldebjerg, Langeland, that they existed there in Neolithic times. However, the Troldebjerg houses were of a different type, having only one row of roof-supporting posts.<sup>14</sup> Unfortunately, we do not yet know how early the long-house with two rows of inner roof-posts reached Jutland, because we know almost nothing about our own Bronze Age houses.

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<sup>12</sup> Among the important works should be mentioned:—

Haakon Shetelig, *En aeldre jernalders gaard paa Jaederen*. (Bergens Museums Aarbeg, 1909).

Jan Petersen, 'Gamle Gårdsanlegg i Rogaland', I-II, 1933 and 1936. (Instituttet for sammenlignende Kulturforskning, serie B, XXIII and XXXI).

Sigurd Grieg, 'Jernaldershus på Lista'. (Instituttet for sammenlignende Kulturforskning, serie B, XXVII, 1934).

Mårten Stenberger, *Öland under äldre järnåldern*. (Stockholm, 1933).

<sup>13</sup> Albert Egges van Giffen, 'Der Warf in Ezinge, Provinz Groningen, Holland, und seine westgermanischen Häuser'. *Germania*, 1936, Jahrg. 20, p. 40-47.

<sup>14</sup> J. Winther, *Troldebjerg, en bymaessig Bebyggelse fra Danmarks yngre Stenalder*. (Rudkøbing, 1935).



# Egyptian Portrait-Sculpture

by ALEXANDER SCHARFF\*

*Professor of Egyptology, Munich University*

WE are often far too ready to apply to Egyptian art the same standards which we use in dealing with Greek, Roman, medieval and modern works. Thus, for example, we are apt to speak of Egyptian 'masters' or 'master-hands', expressions which constantly occur in connexion with Greek sculpture or Renaissance painting; or we assume that the identity of an Egyptian portrait can be established just as if it were a question of a definite Renaissance personality. Now one of the chief characteristics of Egyptian art is its impersonality. The Egyptians had no conception of a work of art produced, so to speak, from *pietas*, to perpetuate the features of some dear departed, or such as it would be pleasant to possess from sheer delight in artistry; in particular, the artistic contemplation and enjoyment of a work of art as we understand it could scarcely have been understood by an Egyptian.

In Egypt, artistic creation was handicraft in the best sense of the term, and every work of art owed its being in some way to religious considerations. Those are the two corner-stones on which all understanding of Egyptian art is necessarily based. The protector of the handicraftsman and of the artist was the god Ptah of Memphis, who himself as Creator shaped men on the potter's wheel. The hieroglyph for all words connected with art and handicraft is the tool with which stone vessels were hollowed out in primitive times, and the high priest of the god Ptah was called 'Chief leader of the handicraftsmen', or, if you prefer it, 'of the artists'—for the Egyptian language possessed but one word for both. Thus in a painting of the time of Ramses II, the creator of a statue and the maker of a chair sit peacefully together in their workshop. The only distinction made in the accompanying inscription is that the sculptor is called 'the Quickener': that is a term which became current in the New Empire to explain the function of sculpture, which is to keep the dead man alive by means of his image,

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\* Translated by R. G. Austin.

## EGYPTIAN PORTRAIT-SCULPTURE

rather for the soul in the grave than for the survivors who do sacrifice to it. That brings us to the second cardinal point of Egyptian sculpture—religious service.

The collections of statues which we admire in museums invariably come from tombs or temples : therefore they either served the cult of the dead, as for instance the so-called Ka-statues of the Old Kingdom, or were consecrated to a god, or else they represented the deified king, a god himself, or a divine animal. It would be difficult to point to an Egyptian statue which does not fall into one or other of these categories. The absolute contrast between the modern conception of sculpture and the early Egyptian may be most clearly seen if we consider the way in which most grave-statues of the Old Kingdom were arranged. An important element of the tomb of the nobles of that time (*c.* 2500 B.C.), the Mastaba, was the statue-chamber, known today as Serdab. Normally it is a tiny undecorated rectangular room, with no door ; it was either entirely separate from the cult-chamber of the tomb (in which sacrifices were made to the statues erected in the Serdab), or else was connected merely by an aperture in the wall. Very nearly dark as was this cult-chamber, the darkness of the statue-chamber was complete : no one could see and admire the statue. Further, as if this absolute seclusion were not enough, the statue was often placed in a hermetically sealed stone chest : for example the group of the dwarf Seneb and his family at Gizeh, which to us is specially pleasing. If we keep properly in mind this secretive disposal of the statues, it is an obvious profanation for a modern to bring them to the light of day and set them in museums where they can be viewed from every side. Only on rare occasions did the Egyptians of the later Old Kingdom relax their austere practice, as for instance where the statue-chamber was made so far accessible that the visitor could go round it and peep at the statues (only through the aperture, of course) ; or where, as in the largest of the Sakkara tombs, the statue of Mereruka, the occupant, stands actually at the opening which does duty for a door in the cult-chamber, as if it wished to come down and receive the sacrificial meats.<sup>1</sup> The temple-statues were products of genuine religious art in the truest sense ; even the dedicatory statues of private individuals were primarily directed to the divinity, even if at the moment of erection they served to perpetuate the fame of the dedicator ; they were continually being

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<sup>1</sup> Capart, *Memphis*, fig. 317 ; there are also exceptional cases of Mastabas where the statue was placed in the cult-chamber (e.g. *Journal of Egyptian Archaeology* VI, plate 25).

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ousted by new dedicatory statues, as is proved by the numerous figures discovered in the *cachette* in the temple of Karnak. None of these statues possessed contemplative value in the modern sense.

It should be sufficiently obvious from this that just as the character of art in Egypt differed from that of modern art, so also did the function of the artist as we know it, and that the appearance of sculpture must have been quite differently conditioned. A creative personality such as Phidias or Michelangelo, which can conceive, modify, and carry out a work entirely from a desire for artistic creation, was unthinkable in ancient Egypt. Certainly a creative artist is concealed behind the anonymity of most Egyptian works of art, for every genuine work of art owes its inception to the creative endeavour of an individual ; but his identity is never betrayed. Occasionally a sculptor of a relief allows a quite subordinate image of himself to appear on a tomb, or he may refer proudly to his achievement in the inscription, but he never shows by a signature that the work is his own spiritual conception.

Corresponding to this anonymity on the part of the artist is a similar anonymity in the art itself, which, as we think, excludes portrait-sculpture on the lines which are familiar from the art of other countries. It is not my purpose here to penetrate the inner significance of Egyptian figures in the round ; for that, reference should be made to the far too little known work of Heinrich Schäfer, *Von ägyptischer Kunst* (sculpture is treated in the 6th chapter of the 3rd edition), which unfortunately has not yet been translated into English. Their figures in the round are very closely connected with relief ; we may say that such work originated as three-dimensional drawing. For statues were not, as with us, first formed freely out of clay, but, as countless models show us, the outlines were first drawn on the four sides of the surface to be worked, and from those outlines the artist cut into the block to shape his model. It was therefore a question of uniform working from outside to inside, so that every Egyptian figure is, so to speak, enclosed by an invisible, oblong frame, which prevents free movement in any desired direction. This means more than the usual implication of the term ' frontality ', and it applies not only to individual figures, but to whole groups as well. A Borghesi warrior would be just as impossible in terms of Egyptian art as the Laocoon group. This method obtained also to some extent in archaic Greek sculpture ; and the great artistic achievement of the Greeks was that in place of it they substituted a figure which was directed outwards from an inner central point, and whose movement was therefore





COLOSSUS OF PRINCE HEMIUN, FROM GIZA; 4TH DYNASTY, c. 2700 B.C.

*Peliziüs-Museum, Hildesheim*

PLATE II



THE DWARF SENEb, WITH FAMILY, FROM GIZA ; 6TH DYNASTY, c. 2300 B.C.  
*Cairo*



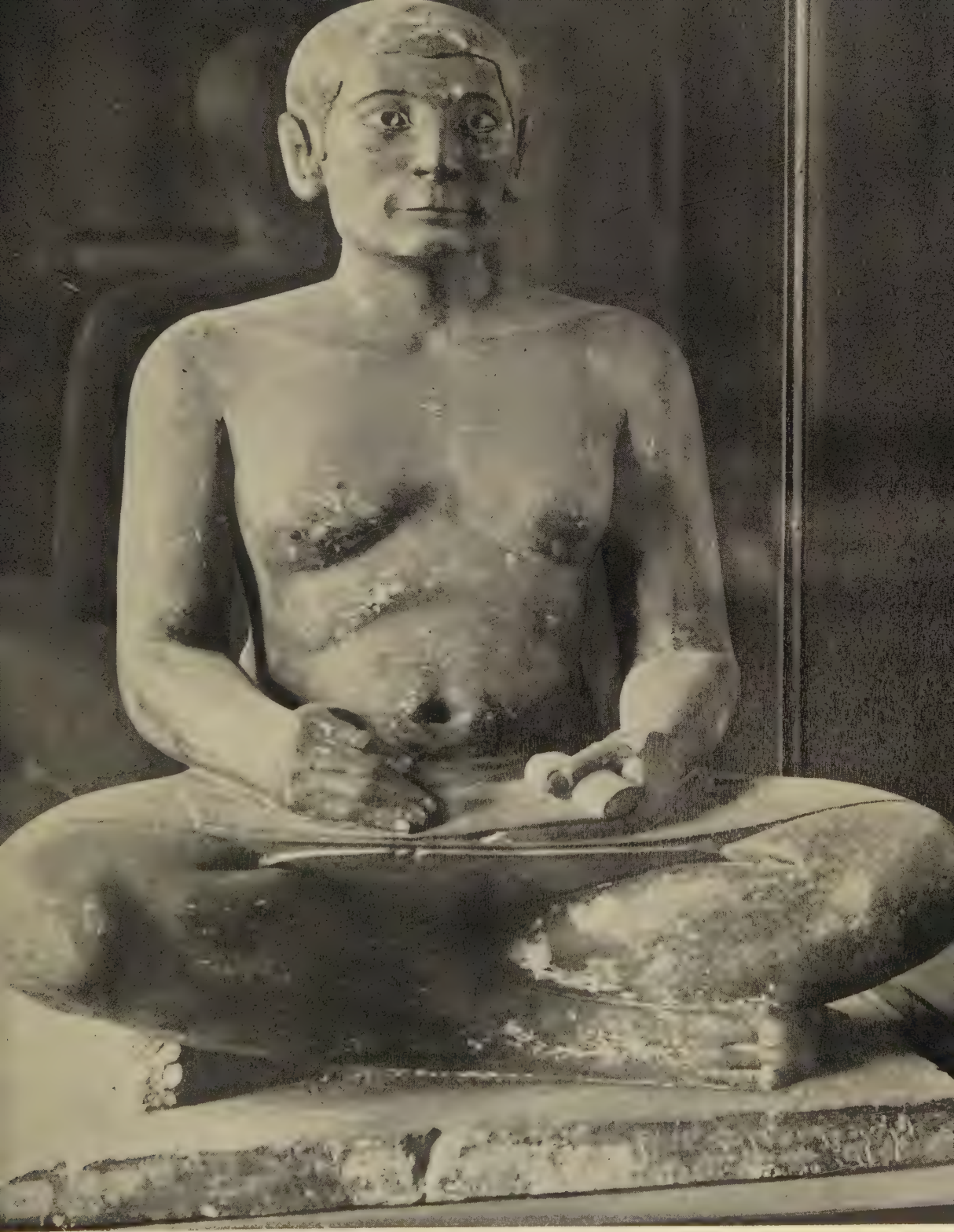


PLATE III

THE SCRIBE; 5TH DYNASTY, c. 2500 B.C.

*The Louvre*



PLATE IV



HEAD OF SESOSTRIS III; 12TH DYNASTY, *c.* 1880 B.C.  
*Berlin*



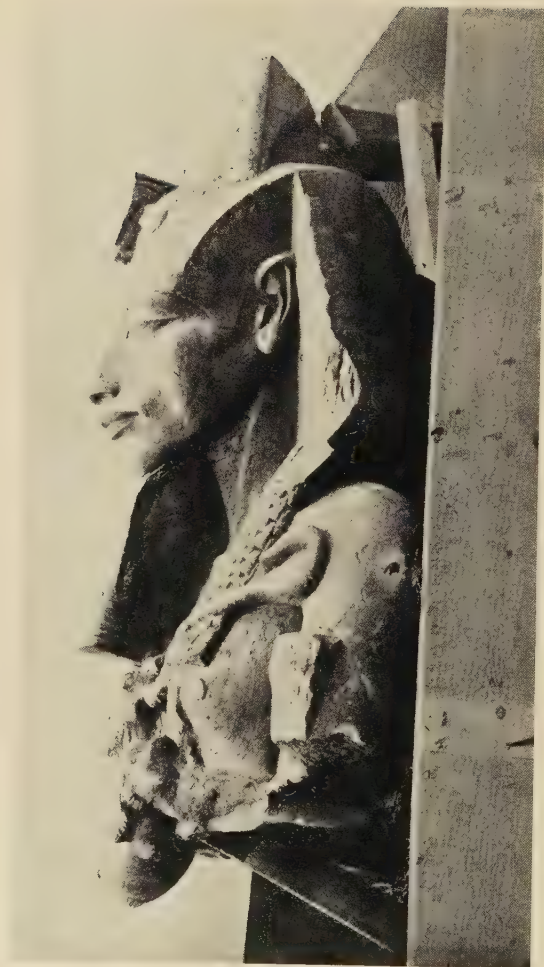
PLATE V

AMENEMHAT III, 12TH DYNASTY, c. 1830 B.C.  
*Copenhagen, Ny Carlsberg Glyptothek*

PLATE VI



1. STATUETTE OF A NUBIAN  
(IRIGADIGANEN)  
25TH DYNASTY, c. 700 B.C.  
*Cairo*



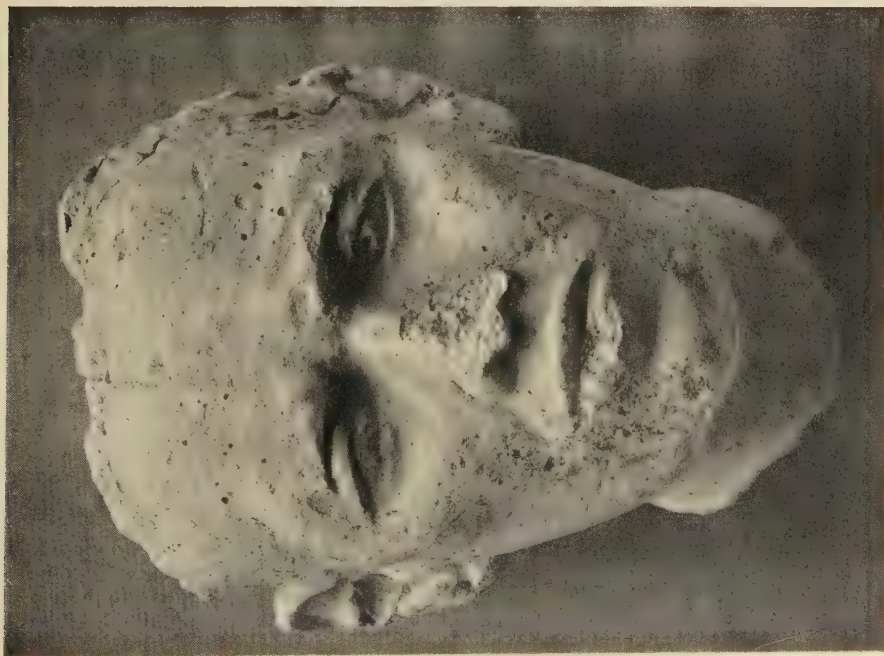
2. AMENOPHIS IV, KARNAK; 18TH DYNASTY  
c. 1370 B.C.  
*Cairo*



PLATE VII

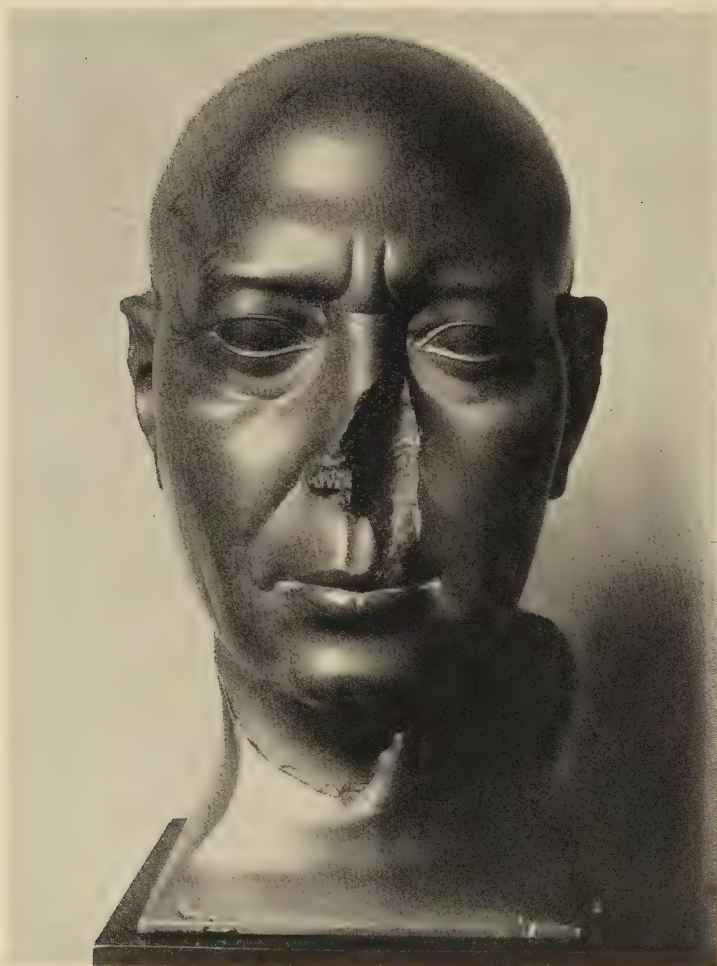


PLASTER MASK OF A WOMAN, FROM AMARNA; 18TH DYNASTY, c. 1360 B.C.  
*Berlin*



PLASTER MASK OF A MAN, FROM AMARNA; 18TH DYNASTY  
c. 1360 B.C.  
*Berlin*

PLATE VIII



PRIEST'S HEAD (THE 'GREEN HEAD'); 30TH DYNASTY, c. 350 B.C.

*Berlin*

## EGYPTIAN PORTRAIT-SCULPTURE

free. However much we may admire Egyptian art, we cannot deny that this made their work far superior to that of the Egyptians, and as a result of the pervasion of classical Greek influence throughout all departments of art, the bridges connecting us with Egyptian artistic principles were once for all broken down. This fact must always be kept in mind, for it explains why, for us, Egyptian art always maintains its frigid reserve and distinctiveness.

In considering the countless human figures in Egyptian sculpture, we must distinguish true masterpieces from indifferent productions, which are much more numerous. Here we can only treat of the finest productions in an attempt to define how far the Egyptians created portrait-sculpture in the modern sense of the term. By 'portrait-sculpture' must be understood every human figure which, in its general form and especially in its facial features, represents as faithfully as possible not only the external appearance of the original but also the essential inner characteristics, the soul as one may say, of his personality. Such a demand, proceeding as it does from our modern aesthetic sense, cannot be completely met, as must now be clear, just because it runs counter to the anonymity characteristic of Egyptian art. It would therefore seem unreasonable to make such a demand; yet, on the other hand, it must be strongly emphasized that the non-fulfilment or, as we shall presently see, the incomplete fulfilment of that demand ought in no way to be accounted a weakness of Egyptian art, for there are certain unwritten laws which absolutely forbade it.

Let us consider the body first of all. It is a law of Egyptian sculptors to represent only healthy bodies in the full elasticity of youth, that is, the bodily ideal of their art, moulded according to the principles enunciated above. Therefore, most Egyptian bodies look very similar, and it would be a tedious business for us if the majority of our statues from ancient Egypt were headless. The conception of the 'torso' as an independently significant artistic structure is foreign to Egyptian art, and it is noteworthy that the two exceptional cases in which a modern finds pleasure in contemplating an Egyptian torso occur in a sphere where portrait-sculpture was also possible—the royal sculptures of the Middle Kingdom<sup>2</sup> and the art of Amarna.<sup>3</sup> It is only very rarely that any deviation from the normal occurs in such statues as have been preserved unmutilated, as for instance in the Old

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<sup>2</sup> Torso of Sesostris I from Tanis (Evers, *Staat aus dem Stein*, I, plate 39).

<sup>3</sup> Torsos of princesses in University College, London (Catalogue of the Burlington Fine Arts Club, 1922, plate 9).



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Kingdom we sometimes find a dwarf<sup>4</sup> or a hunchback;<sup>5</sup> this only happens with figures of menials, quite subordinate to the main theme, where the laws of art might sometimes be violated even in relief. Only in the rarest cases does the body help to further the artist's object of making his work approximate to an exact portrait of the original: among such I would class the Colossus of Prince Hemiu (PLATE I), which represents the ideal, according to Egyptian taste, of the well-to-do old man, and also the dwarf Seneb in his family group, where the conjunction of the great, intelligent head with the dwarfish body gives us a vivid picture of his personality. There might be one or two more examples of this kind—they are again found occasionally in the art of Amarna; but as a general rule we may say that the body by itself has no connexion with realistic portraiture.

Before turning to the treatment of the head, we must consider a typically Egyptian device which for the Egyptians at any rate often replaced our desire for realism in portraiture: I mean the superscription of the name. The mere fact that the title and names of the figure represented were inscribed in hieroglyphic on his chair or pedestal, made, for the Egyptians, a definite person of him, even if his actual appearance was entirely different. This is difficult for us to realize, because we have lost all consciousness of the magic power of names. But that it had great meaning to the Egyptians, even in the enlightened New Empire, is evident from the countless usurpations of royal statues by later rulers. One only had to change the name in the superscription, and at once the figure was no longer Sesostris from the Middle Kingdom but Ramses from the New Empire, 600 years younger! It is but seldom that any noticeable attempt was made, otherwise than by changing the name, to alter the style of a figure to that of its contemporary period—*e.g.*, in a 12th Dynasty statue in Berlin of Amenemhat III appropriated by Merenptah (19th Dynasty).<sup>6</sup> This significance of the name on the statue meant so much to the Egyptians that their sculptors had no need to attempt, as would a modern, what is to us the vital problem of the actual portrait.

As Schäfer once showed, in a paper on portraiture,\* the Egyptian sculptors in general never advanced beyond a portrait which might be that of anyone of the period. The heads of the Old Kingdom have a

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<sup>4</sup> Capart, *Memphis*, fig. 341.

<sup>5</sup> *Ibid.*, fig. 335.

<sup>6</sup> H. Fechheimer, *Die Plastik der Ägypter*, 1914, p. 52-3.

\* A new and enlarged edition of this appeared, when my present paper was already written; H. Schäfer, *Das altägyptische Bildnis* (Leipzig. Aeg. Stud. 5), Glückstadt 1936.

## EGYPTIAN PORTRAIT-SCULPTURE

certain uniformity of appearance ; it is possible to make subdivisions for the principal dynasties (3rd-6th), and thus to work out a style of portraiture conditioned by period, but no more ; and the same is true of the other main periods, the Middle Kingdom, the New Empire, and the late epoch. This fact is in agreement with my previous remarks on how plastic art began. For an Egyptian, the way led from the outside inwards, and the anonymity of the artist was associated with a corresponding anonymity in the personage depicted. According to Egyptian ideas, only the name-inscription, likewise an external addition, imparts personality and individuality to a statue. When modern authorities attempt to infer the life-age of an Egyptian figure from his facial appearance, they are attempting what the art of Egypt forbids them to do. A long dispute once arose over the two statues in Cairo known, from the name-inscription, to represent Ranofer (5th Dynasty) : the one was thought to be the youthful and the other the aged Ranofer. Recently a brilliant piece of research was carried out by Engelbach : by making a plaster cast of the wig on the one figure and fitting it on to the bald head of the other, he showed that both faces under the same wig are practically identical.<sup>7</sup> I myself am convinced that both show, not the actual face of the individual Ranofer, but only a fully-developed representation of the facial ideal of the 5th Dynasty. Still, even after this striking experiment, both faces will continue to count among the supreme achievements of Egyptian plastic. To sum up, if I were asked where in the Old Kingdom I can detect real portrait-sculpture, in our sense of the term as defined above, my answer, heretical though it may sound, is—nowhere ! But I am willing to make this concession, that the sculptures of Prince Hemiun (PLATE I) in the 4th Dynasty, and of the dwarf Seneb (PLATE II) in the 6th, as well as the justly famous Scribe of the Louvre (PLATE III) in the 5th, approximate most nearly to our modern requirements.

A similar negative reply is necessary, to my mind, when we come to the New Empire sculpture of the 18th and 19th Dynasties. Without going into detail, let me just emphasize that the dispute as to whether a royal figure represents Thutmosis III or his half-sister Hatshepsut appears to me basically futile. The representations of this great ruler, often beautiful, are again only types of the ideal ruler of the period in question. The same holds good of the discussion concerning the portrait of Ikhnaton and his successors, for even the art of Amarna, after its initial impulse, produced an ideal royal type.

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<sup>7</sup> *Mélanges Maspero*, I, p. 101 and plate.

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True portraits, according to our definition, were only achieved by the Egyptians when sculpture as a whole was on the point of bursting the fetters of its strict laws ; this occurred only three times in the long course of the many thousand years of its history—at the zenith of the Middle Kingdom, in the Amarna period, and about the middle of the first millennium B.C., that is, in the late epoch. In these periods, sculptors were genuinely concerned to bring out the inner human personality of their originals, and to give a faithful portrayal of men with the chief points, good or bad, of their character. In this way H. G. Evers, a modern historian of art, in his penetrating account of the sculpture of the Middle Kingdom, has been able with certainty to ascribe certain unnamed royal heads to the two great rulers Sesostris III (PLATE IV) and Amenemhat III (PLATE V).<sup>8</sup> Even if the external features of the countless royal heads of this period show no correspondence with them, the strong, energetic, masterful features of the one and the resigned, earnest, thoughtful characteristics of the other are easily recognizable here.

The religious movements of the Amarna period are too well known to need any fresh exposition. At the beginning of this short but important epoch, there was a rebellion against tradition ; thus the ugly statues of Amenophis IV from Karnak (PLATE VI, 2) may be regarded as genuine portrait-sculpture—in fact, we can speak here of an actual excess of personality in sculptural representation. The royal heads from the city of Amarna itself show much greater restraint. Here as nowhere else we get a glimpse of the conditions imposed by time and place, and we see artistic creation alive and growing. The German excavations before the war and those of the English after it have provided us with inexhaustible finds. But these artists and most of their works remain anonymous ; and it must always be emphasized that Thutmosis, so often spoken of as possessor of the most famous workshop, is nowhere indicated by a signature, and his name occurs only quite incidentally on an unimportant object found on the workshop site. We have no right therefore to venerate a ‘ Master ’ Thutmosis as the sculptor of the Nefertiti busts. This wonderful series of masterpieces,—the lovely head of the Queen<sup>9</sup> discovered by Pendlebury, and many others—present difficult problems in connexion with realistic portraiture, as do

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<sup>8</sup> *op. cit.*, II, p. 108 ff.

<sup>9</sup> *Journal of Egyptian Archaeology*, XIX, plate 12 (unfortunately not taken from a good angle.)



## EGYPTIAN PORTRAIT-SCULPTURE

also the numerous heads of princesses. Here in the portraiture of the Queen we may claim to detect differences in age. Definite portraits such as completely fulfil our demands are to be seen in the plaster masks now in the Berlin Museum, taken for the most part from the living face. If we examine this group of heads, and in particular those of private individuals (PLATE VII), we are constantly surprised to see how completely they differ from all other Egyptian plastic. The late Dr H. R. Hall attempted to explain this un-Egyptian quality by suggesting that these are the heads of foreigners, not Egyptians. But is it really probable that we should have found only the heads of non-Egyptians at Amarna? Certainly, foreign blood may often have flowed in the veins of the men of that period, but for all that they were Egyptians; and I would rather explain the difference by assuming that in the plaster masks the artist has for once lifted the veil drawn everywhere else over Egyptian plastic art by its rigid governing principles. Here for once we really have actual persons before us, as they lived at the court of Ikhnaton, that is, we have portrait-sculpture in the truest sense. And I should like to believe, although of course it cannot be proved, that the heads of the stone statues made from those masks would not have revealed any trace of this living reality; in their case, that same veil would certainly have hidden from us much individual detail.

Lastly, out of the mass of sculpture of the late epoch a few heads emerge which we may confidently acclaim as portrait-sculpture. Although these works belong to an age bordering closely on the Greek, they have nevertheless been comparatively neglected both historically and from the point of view of the history of art; therefore a few examples must suffice. The art of the first millennium B.C. in no way exhausted itself in the copying of earlier works. One and the same man, Mentuemhet, who lived in Thebes about 700 B.C., has left statues of himself which represent him in the style of the early New Empire,<sup>10</sup> in the polished style of the late epoch,<sup>11</sup> and with complete realism.<sup>12</sup> It was just at this period that a marked realism occasionally appears in sculpture: a particularly drastic example is to be seen in the statuette of a Nubian in Cairo (PLATE VI, 1), which leaves nothing to be desired as a piece of realistic portraiture. We cannot yet clearly explain this trend towards realism in the late epoch. It reaches its extreme limit

<sup>10</sup> Schäfer-Andrae, *Kunst des alten Orients* (*Propyläenkunstgeschichte*, II) p. 433.

<sup>11</sup> Legrain, *Statues et Statuettes*, III, plates 46-7, nos. 42237-8.

<sup>12</sup> *Ibid.*, plate 44-5, no. 42236.

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in the so-called 'Green Head' in Berlin (PLATE VIII) and kindred works, which in their unique inner power of expression are certainly not purely Egyptian, but stand on the threshold of the period when the Greek artistic spirit found its way into Egypt, before which the now ageing Egyptian art gradually gave way.

If we could to-day confront an ancient Egyptian, say of the period of Thutmosis III, with a selection of the best works of Egyptian art of all periods, and ask him his opinion as an artist, he would most probably condemn just those three groups to which I have here alluded as embodying real portrait-sculpture, on the ground that they were foreign to his spirit, over-accentuated, and abominably 'modernising'; and he would probably point to the Ranofar of the Old Kingdom or to a statue of Thutmosis III as examples of genuine, sound Egyptian art. Anyone who feels that he has to some extent entered into the world of Egyptian art will hold the same view. I would emphasize again the warning with which I began this article—that we should beware of measuring the art of Egypt by our own standards. It remains incomprehensibly great and deserving of honour, even if it cannot fulfil all our expectations in the sphere of portrait-sculpture.

# The 'Dolmens' of Southern Britain

by GLYN DANIEL

**O**BSERVATION not guided by ideas, even hypothetical ideas', says Professor Wolf, 'is blind; just as ideas not tested by observation are empty'.<sup>1</sup> The student of megalithic monuments has as constantly to regret that early antiquaries were not more aware of the necessity of making accurate plans and of recording morphological and constructional details of the monuments—many alas, now ruined or vanished—which they visited, as he has to deplore their delight in formulating theories which they never tested by field-survey; but he has also to cope with evils more dangerous even than these, namely observation so dominated by false or imprudent hypotheses that it results in a distorted vision worse by far than mere blind observation or empty ideas.<sup>2</sup> Some of these hypotheses—like the Druids, the Ancient Egyptians, the metal-working Prospectors, the megalithic race, solstitial and clock-star alignments,—to mention only a few, have been disproved by research and flourish today only among perverse and illogical archaeologists. Others—such as the concept of the Montelius dolmen here examined in its relation to southern Britain<sup>3</sup>—while just as inadequate and inaccurate, are the common-places of modern text-books.

The etymology of the word 'dolmen' is disputed. The word is apparently not known in that form before 1807 and seems to be a variant of a Low Breton word *dolmin* or *dolmine*.<sup>4</sup> Corret observed that this word was used by the peasants of the Morbihan to describe certain megalithic burial-chambers near Locmariaquer, and he adopted it to

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<sup>1</sup> A. Wolf, *Essentials of Scientific Method*, 1928, p. 23.

<sup>2</sup> e.g., the theory that some burial-chambers are built on low artificial hills, has led some archaeologists—even Montelius himself—to record *beneath* chambers such low mounds which have no objective existence. See Crawford, *Long Barrows of the Cotswolds*, pp. 148-9.

<sup>3</sup> 'Southern Britain' here means Wales, and England south of Mersey and Humber.

<sup>4</sup> See Murray, *N.E.D.*, s.v. Dolmen; S. Reinach, *Revue Archéologique*, 1893, series 3, xxii, 36-7; Déchelette, *Manuel d'Archéologie*, I, 374-5.



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designate all such monuments wherever found.<sup>5</sup> Baron Bonstetten's classic definition<sup>6</sup> is a development of Corret's suggestion; and throughout the nineteenth century the term is widely used in this sense, as, for instance by Bertrand, Barnwell, W. C. Lukis, Borlase, and Gowland. A later French usage distinguished two kinds of burial-chambers: (a) the dolmen, and (b) the *allée couverte*.<sup>7</sup> At first the term *allée couverte* was indiscriminately applied to passage-graves, to the approaching passage of passage-graves, and to gallery-graves; but gradually it came to mean only gallery-graves, and the terms 'dolmen à galerie' and 'galerie d'accès' were used for passage-graves and their approaching passages respectively.<sup>8</sup> Thus it is to denote all burial-chambers except gallery-graves that Reinach, Déchelette, and le Rouzic use the word 'dolmen'. A further restriction in meaning was implicit in Montelius's classification, for he gave specific distinction to the dolmen à galerie, and used the term 'dolmen' to denote simple single-chambered megalithic tombs. Thus it will be seen that what may for convenience be called the Bonstetten dolmen, the Reinach dolmen, and the Montelius dolmen, differ fundamentally.<sup>9</sup> During the last fifty or sixty years the concept of the Montelius dolmen has dominated almost all morphological analysis of megaliths in the British Isles, in Germany, and in Scandinavia.

Oscar Montelius classified the megalithic graves of Scandinavia first into four classes, and later into eight; but essentially his scheme distinguished three main types: (1) the dolmen, (2) the passage-grave,

<sup>5</sup> Théophile Malo de la Tour d'Auvergne Corret, *Origines Gauloises* (Paris, 1796), p. 24.

<sup>6</sup> In his *Essai sur les Dolmens* (Geneva, 1865), p. 3. This is a rare book and the definition is worth quoting: 'Le nom de dolmen s'applique à tout monument en pierre, couvert ou non couvert de terre, d'une dimension suffisante pour contenir plusieurs tombes, et formé d'un nombre variable de blocs bruts (les tables) soutenus horizontalement au-dessus du niveau du sol par plus de deux supports'.

<sup>7</sup> The word is first used by Arcisse de Caumont, *Bulletin monumental*, 1863, p. 582. See also Cazalis de Fondouce, *Allées couvertes*, 1873.

<sup>8</sup> The term passage-grave is used throughout this article to connote tombs such as Cunha Baixa, Kercado, New Grange, Falköping, etc.; the term gallery-grave tombs such as La Halliade, Kerlescant, Browndod, Carn Ban (Arran), etc. It is perhaps worth emphasizing here that these terms are technical and not descriptive; obviously in common parlance there is little difference between passages and galleries.

<sup>9</sup> Dolmens have been defined in ways other than these three primary ones here discussed. A common usage is to describe all free-standing chambers as dolmens. See for example, Windle, *Remains of the Prehistoric Age in England*, pp. 174-5.

## THE 'DOLMENS' OF SOUTHERN BRITAIN

(3) the gallery-grave of various forms.<sup>10</sup> The Montelius dolmen is a rectangular, polygonal or almost circular tomb, walled with orthostats, and roofed with one capstone. In plan it is entirely closed or has one side open, and in some of this latter type two low stones form a small passage outside the entrance. It stands either quite free or in the centre of a low rectangular or round mound, which never reaches up to the level of the capstone. Montelius's classification is not merely morphological: it implies a typological sequence and a relative chronology, for he held that the passage-grave evolved out of the dolmen and in turn gave rise to gallery-graves and cists. The following quotation sums up his argument: 'Les dolmens proprement-dits—c'est à dire les dolmens sans galerie—sont, à mon avis, les tombeaux les plus anciens que nous connaissons actuellement en Suède. La sepulture à galerie est une forme plus moderne, qui s'est développé du dolmen dans le Nord de l'Europe'.<sup>11</sup> The implications of the Montelian theory of the dolmen are fivefold: (1) that it is a specific class of burial-chamber, (2) that it is not found incorporated in a barrow, (3) that it is earlier than other forms of megalithic graves, (4) that the passage-graves evolved out of it, and (5) that this evolution took place in Northern Europe. The last two points need no discussion here. The northern origin of the passage-grave has been frequently disproved, and Montelius himself in his later work postulated two invasions of northwestern Europe, the one associated with dolmens, the other with passage-graves, and he derived the passage-graves of the Western Mediterranean from the *tholoi* of the Eastern Mediterranean, particularly those of the Mesará in Crete. But he still maintained the first three of the implications listed above, which may be called the three key-points in the theory of the Montelian dolmen.

The influence of this classification has been tremendous; but it has unfortunately led prehistorians to classify megalithic monuments not on the basis of their objective morphology, but in so far as they fit in with the Montelian classification. The Iberian peninsula affords the clearest example of this process. The early classifications of Iberian burial-chambers<sup>12</sup> are almost entirely applications of the Scandinavian

<sup>10</sup> A good summary of his earlier classification will be found in *Compte rendu, Cong. inter. d'Anthr. et d'Arch. Préh.*, (Stockholm, 1876), p. 152 ff., 'Sur les tombeaux et la topographie de la Suède pendant l'âge de la Pierre'. His later classification is developed in 'Orienten och Europa', *Antiqvarisk Tidskrift for Sverige* (Stockholm, 1905), XIII, 183.

<sup>11</sup> *op. cit.*, 'Sur les tombeaux . . .', p. 162.

<sup>12</sup> As, for instance, those by Leeds, Obermaier, and Bosch-Gimpera.

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sequence to that area ; it is only in the last ten years that Forde, Fleure, and Peake have described and classified the Spanish and Portuguese material as it exists. The burial-chambers of the British Isles have been similarly forced into the divisions of the Montelius system. Mainly through the work of Anderson and Thurnam the chambered cairns of Scotland and the long barrows of southern England have long been well known, but it has been customary to dismiss the remainder of the British material under the vague and convenient heading of 'dolmens'. According to the old text-books,<sup>13</sup> Ireland was particularly rich in dolmens, they were plentiful in Cornwall and Wales, some were to be found in Gloucestershire and Wiltshire, and a passing reference was always made to Kits Coty as a typical dolmen in eastern England. Nor is this picture out of date, for it is repeated in most modern books and papers.<sup>14</sup> One cannot do better than quote the following from an official handbook published in 1932, 'Chambers conforming to the usual definition of a dolmen are found in the West of England (especially Cornwall and Wiltshire), Wales, and Ireland'.<sup>15</sup> As Estyn Evans and Miss Gaffikin have wisely remarked, 'The dolmen myth dies hard'.<sup>16</sup>

FIG. 1 shows the distribution of burial-chambers in southern Britain.<sup>17</sup> The work of Thurnam and Crawford enables us to distinguish a group of chambered long barrows which may be conveniently described as the Severn-Cotswold group. The distribution of this group is mapped in FIG. 2, and includes south Glamorgan, Brecknockshire, Gloucestershire, north Wiltshire, west Oxfordshire and Berkshire, and Somerset. Many of the chambers in this group are small rectangular or polygonal structures,<sup>18</sup> and, stripped of their long barrows, would be ideal Montelius dolmens. Within the region covered by the Severn-Cotswold group there do occur such chambers which are today free-standing. These free-standing chambers are distinguished on

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<sup>13</sup> See Fergusson, Peet, Rice Holmes, etc. Montelius gives a characteristic account in *Orienten och Europa*, p. 25.

<sup>14</sup> As, for example, Childe, *Dawn of European Civilization*, p. 287: 'Dolmens are common in Ireland, Cornwall, and Wales, and there are some on the coasts (*sic*) of Devon, Dorset, and Wiltshire, and perhaps one in Kent'.

<sup>15</sup> *A Handbook of the Prehistoric Archaeology of Britain* (Oxford, 1932), p. 25. (Produced in connection with the First International Congress of Prehist. and Protohist. Sciences, London, 1932). Note again the emphasis on Wiltshire.

<sup>16</sup> *Irish Naturalists' Journal*, July 1935, v, 5.

<sup>17</sup> Based on a field survey made during 1933-36. I take this opportunity of thanking Mr W. F. Grimes for his invaluable assistance with the Welsh material.

<sup>18</sup> e.g. Randwick, Tinkinswood, Manton Down, Gatcombe Lodge.





FIG. 1. DISTRIBUTION-MAP OF THE BURIAL-CHAMBERS IN SOUTHERN BRITAIN  
(ISLES OF SCILLY NOT SHOWN)

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FIG. 2; good examples of them are Gwernvale near Crickhowell, Pentyrch in the Vale of Glamorgan, the Devil's Den in Clatford Bottom, the Hoar Stone, Enstone, and the Whispering Knights—both in Oxfordshire. It will readily be seen how very few examples there are,<sup>19</sup> and that their distribution is coincident with that of the chambered long barrows, *i.e.*, they do not occur in parts of Gloucestershire or Wiltshire or Glamorgan in which there are no chambered barrows. Despite this however, they have frequently been claimed to belong to a different and earlier class of megalithic tomb than the typical Severn-Cotswold chambered long barrow—in fact, that they are typical Montelius dolmens. Crawford however has argued that these 'dolmens' marked on FIG. 2 are no more than the denuded remains of chambered long barrows.<sup>20</sup> The present writer is in complete agreement with this thesis; it is quite unjustifiable to speak of 'dolmens' as separate morphological entities in the area covered by the Severn-Cotswold group.

Kits Coty and Coldrum in Kent were favourite text-book examples of Montelius dolmens. Crawford has however drawn attention to the remains of the long barrow at Kits Coty, and suggested that this 'dolmen' may be no more than the false entrance or 'dummy portal' of a long barrow.<sup>21</sup> He suggests moreover that the Medway group may be regarded as an eastward extension of the Severn-Cotswold group, in which case the remarks already made on the dolmens of that group would be equally applicable here. I think it more likely however that Kits Coty is the remains of a small rectangular chamber of the Coldrum type than of a false portal. The morphological affinities of the Medway group with certain burial-chambers in the Netherlands have been frequently pointed out;<sup>22</sup> the geographical isolation of the group from the Severn-Cotswold group, and its concentration on the

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<sup>19</sup> The Devil's Den in Clatford Bottom is the only example in Wiltshire existing at present and Goddard, Crawford, and Passmore have independently recorded the remains of a long barrow here.

<sup>20</sup> *Ordnance Survey, Prof. Papers*, N.S., no. 6, p. 4; *Long Barrows of the Cotswolds*, p. 21; *Map of Neolithic Wessex*, p. 6. Some have suggested alternatively that these free-standing chambers here discussed were covered with round mounds. Crawford has dealt with this suggestion. It would be indeed curious if all the chambered round barrows in this region (with the possible exception of Greenwell 217) had been denuded while so many of the chambered long barrows remained intact.

<sup>21</sup> *Ordnance Survey Prof. Papers*, N.S., no. 8, p. 3.

<sup>22</sup> Fergusson first suggested a north-European origin for the Medway megaliths. See also John Ward, *Arch. Camb.* 1916, p. 242; Fleure and Peake, *J.R.A.I.*, LX, 63.

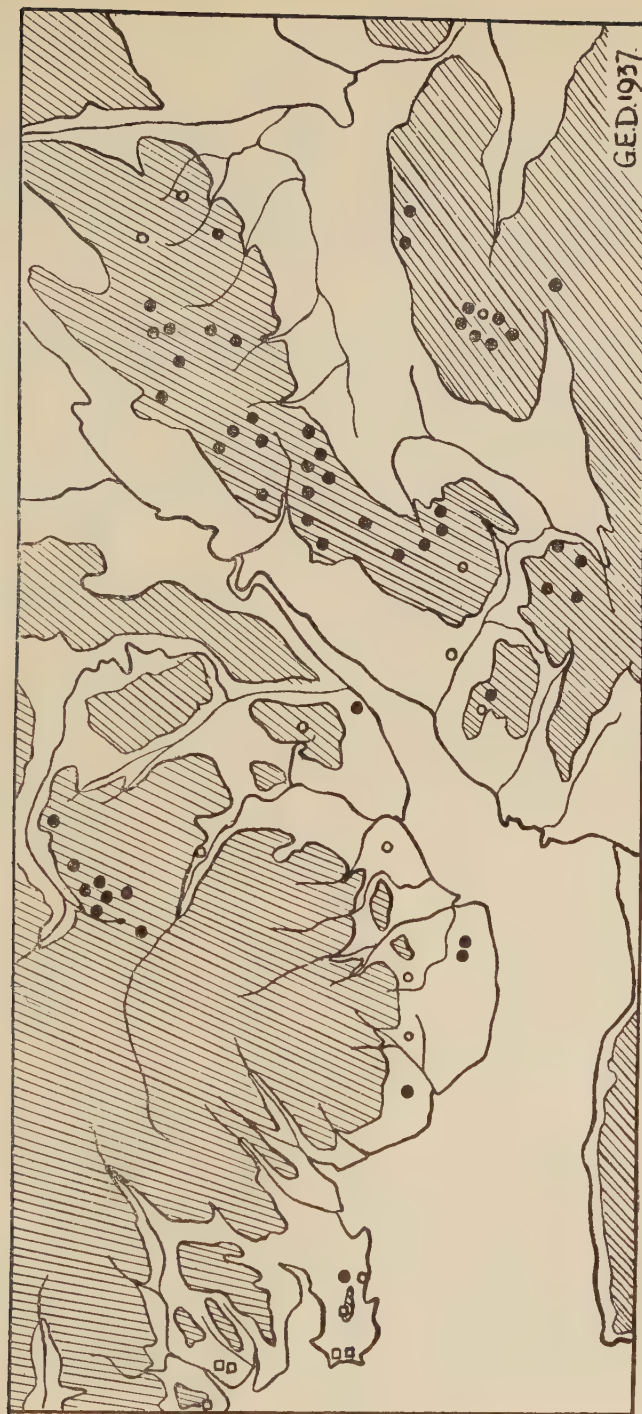


FIG. 2. SKETCH-MAP SHOWING THE DISTRIBUTION OF THE SEVERN-COTSWOLD GROUP

Solid dots=chambered long barrows. Open dots=free-standing chambers. Squares=chambers belonging to other morphological groups



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Medway valley are all in favour of a Dutch origin. But whatever may be the origins of the group, it is clear that again we have no dolmens here ; Kits Coty, Coldrum and Addington are long barrows with chambers at their eastern ends, and it seems probable that Lower Kits Coty and the Chestnuts at Addington are remains of similar structures.<sup>23</sup>

A third group of burial-chambers exists in southern Britain, which may be called the Scilly group, and which is characterized by small gallery-graves enclosed in round mounds. Dr William Borlase first recognized this type in the eighteenth century, and it has recently been studied in detail by Hencken.<sup>24</sup> This group is concentrated in the Isles of Scilly, where over 40 typical examples still exist, but a few good examples such as Pennance, Treen (two), and Brane in Sancreed, exist on the mainland in Penwith.<sup>25</sup>

There are just a few passage-graves in North Wales. Bryn Celli Ddu in Anglesey is well known, while ten miles west of it Barclodiad y Gawres at Treacastle Bay reproduces fairly accurately the cruciform plan characteristic of the central Irish passage-graves. A 17th-century drawing of Ystum-cegid-isaf in Lleyrn, and the accompanying description, strongly suggests that it was originally a passage-grave.<sup>26</sup> These are the only undoubted passage-graves (*sens. stric.*) in southern Britain. Hemp suggests that Plas Newydd may be another passage-grave,<sup>27</sup> but the smaller of the two chambers, which he claims as an ante-chamber, may equally well be a side-chamber as at Rondossec III, near Plouharnel (Morbihan). There are also a few typical gallery-graves in England and Wales, apart from the groups already mentioned. Trefignath on Holy Island is a good example and is segmented ; while Hen Drefor and Dindryfol on Anglesey are almost certainly similar monuments, as Grimes suggests.<sup>28</sup> The Bridestones near Congleton in Cheshire is another typical gallery-grave.

So far we have distinguished five morphological groups among the

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<sup>23</sup> But Piggott thinks the Chestnuts site may have had a round barrow (*P.P.S.*, 1935, p. 122). There seems to me little evidence to support this suggestion.

<sup>24</sup> *Archaeology of Cornwall and Scilly*, 1932 ; *Ant. Journal*, 1933, p. 13 ff.

<sup>25</sup> Tregaseal, Chapel Carn Brea, Tregiffean Vean, and perhaps Carn Gluze probably represent degenerate gallery-graves of the Scilly type.

<sup>26</sup> Richard Farrington, *Snowdonia Druidica*, 1769, opp. p. 175. This is an unpublished ms. in the National Library of Wales, and I am indebted to Mr W. F. Grimes for drawing my attention to it.

<sup>27</sup> *Archaeologia*, 1935, LXXXV, 253.

<sup>28</sup> *P.P.S.*, 1936, pp. 119-120.



FIG. 3. DISTRIBUTION-MAP OF SITES BELONGING TO THE LONGHOUSE, ZENNOR, AND THE LONGHOUSE-ZENNOR DERIVATIVE GROUPS

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burial-chambers of England and Wales : (1) the Severn-Cotswold group, (2) the Medway group, (3) the Scilly group, (4) the passage-graves of northwest Wales, and (5) the gallery-graves in Anglesey and Cheshire. It must be emphasized that this paper is not a constructive morphological analysis of the burial-chambers in southern Britain, but merely a criticism of the application of the Montelius dolmen theory to the megalithic tombs of that area. It is thus impossible to deal here with the fascinating problems presented by the morphology of sites such as Pant y Saer, Mininglow South, Greenlow, Five Wells and West Kennet, or with the group of North Welsh chambered long barrows such as Rhiw in Lleyllyn, the two Carneddau Hengwm in Merionethshire, Tyddyn Bleiddyn in Denbighshire and Capel Garmon in the Conway valley—all of which have, like the Severn-Cotswold sites in Thurnam's class II,<sup>29</sup> lost the importance of the broad end of the long barrow as a normal position for the chamber. These are all exceptional sites, the result probably of regional development in England and Wales, and they do not affect the primary issues here discussed. FIG. 3 is redrawn from FIG. 1 with the omission of the five groups distinguished above and of the exceptional sites mentioned. The superficial student of burial-chambers will confidently label all the sites on this map as Montelius dolmens. Yet do they fulfil the three requirements of the Montelius definition? Are they all of the same morphological type, and are they earlier than the monuments of the other five groups, and finally, are they all devoid of covering mounds? These three questions must be briefly discussed.

It is possible to distinguish two morphological types among the sites mapped in FIG. 3, which may for convenience of reference be called the Longhouse and Zennor types. The first type consists of single polygonal chambers and is of rare occurrence, the best examples being Presaddfed in Anglesey,<sup>30</sup> and Longhouse, Llanrian in north Pembrokeshire, both of which are planned in FIG. 4. Plas Newydd in Anglesey is probably, as mentioned above, a member of this group with a side-chamber to the south.<sup>31</sup> The Hanging Stone near Burton in south

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<sup>29</sup> *Archaeologia*, XLII (1), 215 ff.

<sup>30</sup> C. A. Raleigh Radford has suggested to me that the group of megaliths to the north of the fine chamber at Presaddfed may perhaps be the remains of a passage leading south to the chamber. I am inclined however to agree with Baynes (*Trans. Hon. Soc. Cymmrodorion*, 1910-1911, pp. 21-22) that they probably are the remains of a second chamber.

<sup>31</sup> As Grimes points out (*P.P.S.*, 1936, p. 131), the stone separating the two chambers functions at present as a supporter, but there has clearly been much alteration at this site.



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Pembrokeshire is also probably of this type, as Grimes has pointed out.<sup>32</sup> The Zennor type consists of rectangular chambers and is much more

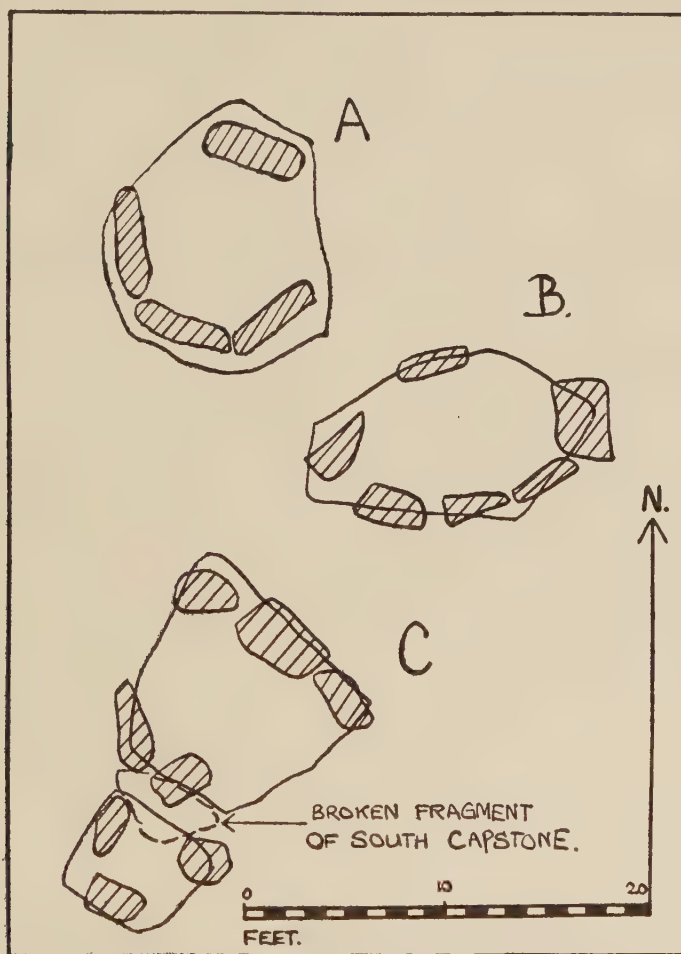


FIG. 4. TYPICAL CHAMBERS OF THE LONGHOUSE GROUP  
(A) PRESADDFED, (B) LONGHOUSE, (C) PLAS NEWYDD

widely distributed. Its distribution falls into three groups : (1) south-western England ; good examples in Cornwall are Mulfra, Chun, Trethevy, Pawton, as well as Zennor itself, while the Grey Mare and

<sup>32</sup> *ibid.*, p. 131.

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her Colts near Abbotsbury in Dorset is very typical ; (2) south-western Wales ; where Penrhiw, Treffynnon, Ebenezer (Llangynog), Penbont (Newport), and the southern of the four chambers on Pendine Head are normal rectangular chambers. The site between Newport and Dinas in north Pembrokeshire, variously referred to as Cerrig y Gof and Cerrig Atgof, consists of a number<sup>33</sup> of rectangular chambers arranged in a circle. Pentre Ifan and Carn Turne are almost certainly of this type ; (3) northwest Wales ; where Bryn yr Hen Bobl and perhaps Bodowyr in Anglesey, Four Crosses, Bachwen (Clynnog), Penarth (Clynnog), and Cefn Isaf in Lley, Gwern Einion, and the two chambers at Dyffryn in Merionethshire, and Hendre Waelod, Maes y Facrell (Llandudno) and the two chambers near Roe Wen in the Conway valley are typical examples of the Zennor type. Cist Cerrig (Treflys) near Portmadoc appears to be the end of another rectangular chamber.<sup>34</sup>

The distinction of the certain and probable examples of the Long-house and Zennor types still leaves many sites on the map (FIG. 3) and these may be classified into two groups : (1) a group confined to west Wales here referred to as the 'sub-megalithic group' ; (2) a number of sites which are morphologically indeterminate or ambiguous. The term 'sub-megalithic' is admittedly unsatisfactory but it is here used to designate a large number of tombs, obviously connected with the more normal burial-chambers of Wales, but which are not constructed in the usual way (*i.e.* with orthostatic walling and trabeate megalithic roof). Some of these (for example Sling (Llandegai) in Carnarvonshire, Carn Wnda and Carn Gilfach in north Pembrokeshire, two at Carn Llidi on St. David's Head, Manorbier in south Pembrokeshire, and the two on Llangyndeirne Mountain in south Carmarthenshire), conform to the 'earthfast' type of Du Noyer, and consist of a megalithic capstone resting at one end on the ground and at the other on an orthostatic wall.<sup>35</sup> Others have extensive rock-cut elements such as Pant-y-Saer, Lligwy, and Glyn. Arthur's Stone, on Cefn Bryn in Gower, has an underpinned capstone, and in the southeastern of the two well known caves at Gop, in Flintshire, is a curious burial-chamber which utilizes the cave walls in its construction. All these chambers

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<sup>33</sup> At present certainly four and originally probably five.

<sup>34</sup> Though it may be, as W. J. Hemp has suggested to me, a false entrance or 'dummy portal'.

<sup>35</sup> For a short account with plans of the Welsh 'earthfast' types see W. F. Grimes, *P.P.S.*, 1936, p. 132 ff.

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present peculiarities of construction rare among the normal chamber-tombs of western Europe, and they do not present any coherence in their morphology. Some approximate closely, as far as the technical limits imposed by their construction allow, to examples of the Longhouse and Zennor types. It seems probable that the sites here referred to as 'sub-megalithic' are degenerate examples of the Longhouse and Zennor types,<sup>36</sup> and that their formal degeneracy is emphasized by a parallel decay in constructional technique.

A number of sites on FIG. 3 are morphologically either indeterminate or ambiguous. Some, such as Mountain and Broomhill Burrows in Pembrokeshire or Ty Mawr in Anglesey, are so ruined that it is impossible to hazard an opinion as to their original form. Indeed some of them are so destroyed as to leave their very genuineness in dispute. Other sites again have been rebuilt and no adequate early plans exist; such are Drewsteignton, Pendarves Park, and the Hellstone near Portisham. The majority of these sites have a number of orthostats with a capstone resting on top, but the arrangement of the uprights is such that no reliable inferences can be drawn about original morphology. Good examples of this type are furnished by Mynydd Cefn Amlwch, Llech y Drybedd, Carn Llys and Lanyon. Classifications of free-standing chambers are sometimes based on the number of orthostats or capstones employed,<sup>37</sup> but there seems little purpose in such arrangements or in distinguishing such structures as 'tripod-dolmens' and 'lichavens', for these distinctions at best imply not original morphology but merely the extent of subsequent destruction. Chambers with only two or three orthostats at present can never, at least in the majority of cases, have been originally so erected. As W. C. Lukis and Barnwell used to point out, such structures could not have been functional chambers. They must surely represent partially destroyed chambers and the paucity of surviving orthostats makes their original plan ambiguous. It is impossible, for instance, to say whether typical 'tripod-dolmens' such as Mynydd Cefn Amlwch or Llech y Drybedd were originally rectangular, or polygonal, or almost circular. But it is most dangerous to assume that morphological ambiguity implies that the chambers concerned 'are of the simple form';<sup>38</sup> they are all varied

<sup>36</sup> Or even, perhaps, of passage-graves or gallery-graves.

<sup>37</sup> Gardner-Wilkinson's is perhaps the best known. See also Macalister, *Archaeology of Ireland*, pp. 115-16.

<sup>38</sup> Grimes, *Map of South Wales showing the distribution of Long Barrows and Megaliths* Ordnance Survey, 1936, p. 12.



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in the formal evidence which they afford, and it is uncertain morphology rather than simplicity that characterizes them. It would be equally dangerous to suppose that these destroyed sites represent a distinct morphological type only persisting in decay. Crawford has suggested, as mentioned above, that the 'dolmens' of the Severn-Cotswold area are partially destroyed chambered long barrows: it is here suggested that this group of sites labelled 'morphologically indeterminate' are really partially destroyed examples of the other morphological groups already distinguished in the rest of England and Wales.

It will be seen that we suggest that the sites on FIG. 3 belong essentially to two morphological traditions, but that many monuments reveal these traditions in a degenerate and decayed form. Grimes has argued against this view in his analysis of the burial-chambers in south-west Wales;<sup>39</sup> he regards the rectangular chambers in this area—citing Penrhiw, Treffynnon, and Ebenezer (Llangynog)—as a 'purely accidental variation' of his 'simple form' such as Llech y Drybedd, Newport, and Llanboidy, a variation moreover due to the use of 'flat slabs'. While we appreciate the influence which available material ever exercises on the form of burial-chambers, this view seems untenable.<sup>40</sup> The orthostats used in building chambers of the Zennor type are frequently identical with orthostats used in chambers of the Longhouse type or in passage-graves: they are certainly no 'flatter'. Again it must be emphasized that the Penrhiw, Treffynnon and Ebenezer sites—as well as many others in Pembrokeshire—can be closely paralleled in Cornwall and in North Wales and, incidentally, in Ireland. It would be difficult to believe that these widely distributed rectangular chambers can all be explained away as accidental variations, and moreover variations of a type whose validity we here deny.

The problem of the relative age of monuments of the Longhouse, Zennor and sub-megalithic types is a more difficult one than that of their morphology. There exists no unequivocal evidence derived from associated grave-goods: we have to rely entirely on formal considerations. It must be obvious that if a normal passage-grave has its passage subsequently destroyed, the resulting structure would be indistinguishable from an example of the Longhouse type. Baynes has shown<sup>41</sup> that Bryn Celli Ddu with its passage destroyed would resemble

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<sup>39</sup> Grimes, *op. cit.*, pp. 11–14.

<sup>40</sup> I have touched on some of these issues in *P.P.S.*, 1936, p. 259.

<sup>41</sup> *op. cit. supra*, p. 23 and fig. 6. It should be observed however that similarity of orientation does not necessarily support Baynes's argument.

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Presaddfed. It seems to me highly probable that the Longhouse type of polygonal single chamber represents in fact partially destroyed passage-graves, and is therefore no earlier than the Bryn Celli Ddu-Barclodiad

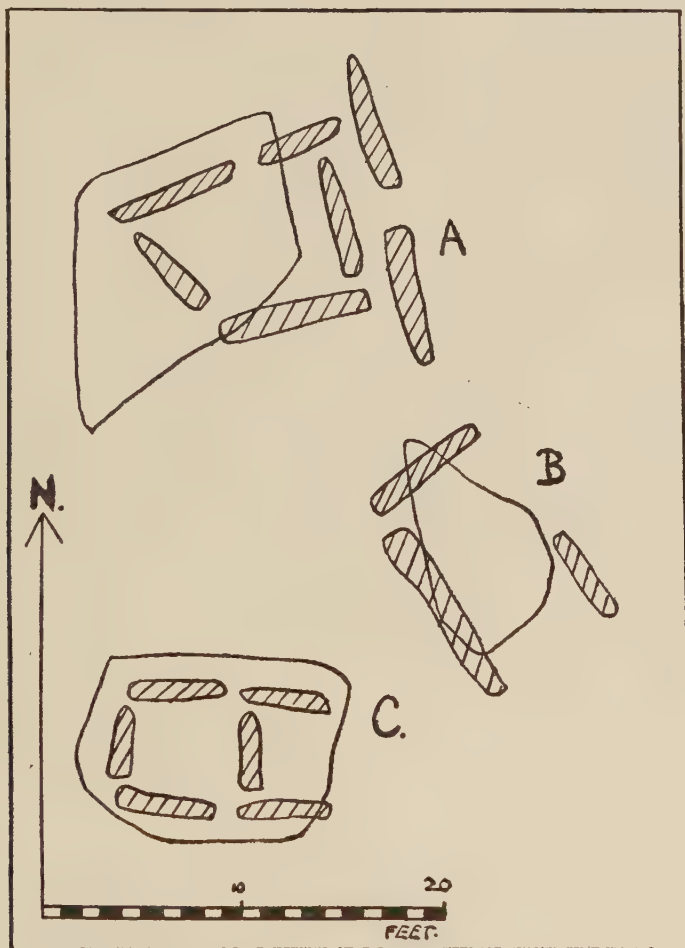


FIG. 5. TYPICAL CHAMBERS OF THE ZENNOR GROUP:  
(A) ZENNOR, (B) PENRHIW, (C) DYFFRYN, MERIONETHSHIRE

y Gawres group. But it may well be, although I deem it improbable, that these Longhouse chambers are still intact from the point of view of chamber morphology, *i.e.*, that they never had approaching passages.

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It would then be possible to argue that they gave rise to the Welsh passage-graves, that they were degenerate passage-graves, or that they had no connexion with the passage-graves in North Wales—the first and third of these arguments would manifestly allow one to claim chronological priority for them, but the complexity of passage-grave morphology as well as the wealth of analogues for the Welsh passage-graves would suggest that the second of these possible arguments was the correct one. The adoption of this thesis again gives a late date to the Longhouse type of burial-chamber. Many burial-chambers of the Zennor type preserve features which unambiguously connect them with more elaborate monuments in the British Isles. Thus Dyffryn, Zennor, and Trethevy have traces of segmentation, while Pentre Ifan and Carn Turne have orthostatically walled semi-circular forecourts, and some sites such as Zennor, Trethevy, and the Grey Mare and her Colts at Abbotsbury (Dorset) have straight orthostatic façades flanking their entrances. All these features remind one of the segmented gallery-graves of northern Ireland, southwest Scotland and Man; and there can be little reasonable doubt that the Zennor group derives from these monuments or from similar derivations of them in other parts of Ireland.<sup>42</sup> It seems therefore probable that gallery-graves such as Trefignath and the Bridestones in southern Britain, which are analogues of the Irish, Scottish and Manx monuments already mentioned, must be earlier than the Zennor group. There is therefore no evidence to support the chronological priority of the Longhouse and Zennor types over all the other burial-chambers in England and Wales.

The task of studying the morphology of the burial chambers of southern Britain is immensely complicated, as Wheeler has recently pointed out,<sup>43</sup> by the paucity of evidence with regard to the form of the associated barrows, and this difficulty is most acute in dealing with the sites mapped on FIG. 3. Fleure and Peake doubt whether some of these sites 'were ever covered by a mound',<sup>44</sup> and Fox and Bowen say 'it is a remarkable fact that with one exception none of the "chambered tombs" of Carmarthenshire—or of the southwestern counties generally—show any trace of a mound or cairn: and it must be considered doubtful whether such ever existed'.<sup>45</sup> Some have gone to the other extreme

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<sup>42</sup> e.g. Gaulstown, Ballynageragh, and Knockeen, all in co. Waterford.

<sup>43</sup> *Archaeological Journal*, 1934, xci, 332.

<sup>44</sup> *J.R.A.I.*, lx, 63.

<sup>45</sup> p. 42, vol. 1, of *A History of Carmarthenshire* (ed. Sir J. E. Lloyd) Cardiff, 1936. This statement is manifestly incorrect. *Vide infra*.



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and roundly asserted that these chambers are 'simply the exposed burial chambers of barrows';<sup>46</sup> while the Congress handbook already referred to claims that they 'are regarded by Crawford as merely the cists of ruined long barrows'.<sup>47</sup> The truth is that many of these chambers show very clear signs of covering or encompassing barrows, while others show none at all.<sup>48</sup> Unfortunately no example of the Longhouse type has any trace of a barrow, but, in view of the suggested affinity of this group with the passage-grave group we may, I think, safely assume that if the Longhouse type had barrows originally they were round ones such as passage-graves in Ireland, Brittany and Spain normally have. With regard to the Zennor type on the other hand, there is much evidence of the former existence of covering barrows, although this evidence is not consistent. Lanyon Quoit stands at the northern end of a low long barrow, Corringdon Ball in south Devon at the southern end of a very fine long barrow, the Grey Mare and her Colts at the east end of another, but Chun is set in a round barrow. In North Wales, Dyffryn, Cors-y-Gedol, Roe Wen North, and Maes-y-Facrell have normal long barrows,<sup>49</sup> and Grimes suggests another long barrow at Bron-y-Foel Isaf. Bryn yr Hen Bobl is however recessed in a round barrow which originally covered it completely, while in South Wales, Cerrig-y-Gof, the four sites on Pendine Head, as well as the two sites known as Sweyne's Houses on Rhossili Down in Gower, all have round barrows. If the affinities mentioned above of the Zennor type with the Irish-Scottish gallery-graves be accurate, this would strengthen the existing evidence that the Zennor type has characteristically long barrows. But its occasional association with round barrows cannot be denied, nor, at present, easily explained. Any further discussion of the form of the barrows which the Longhouse and Zennor types may have had originally would involve us in the intricacies of the theory of the free-standing chamber. Suffice it to say here that argument by analogy

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<sup>46</sup> *Ordnance Survey Prof. Papers*, N.S., no. 13, p. 5 (1936).

<sup>47</sup> *A Handbook of the Prehistoric Archaeology of Britain*, 1932, p. 25. This is an iniquitous misquotation. Crawford says clearly, 'I repeat that I am dealing only with the district covered by Sheet 8 (*of the Ordnance Survey Quarter Inch Maps—G.E.D.*) where, as I believe, megalithic chambers were covered only by long mounds or cairns' (*Long Barrows of the Cotswolds*, p. 21).

<sup>48</sup> Careful excavation and detailed air-photography may reduce the number of those with no barrows visible at present to the earth-bound field-archaeologist.

<sup>49</sup> Even if Grimes's contention (*P.P.S.*, 1936, p. 124) that the mound west of this chamber is natural, be correct (which I deem improbable) there is no doubt that the mound is functionally a 'long barrow'.

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affords no proof, and it cannot be demonstrated that chambers which are now free-standing were originally enclosed in a barrow. There are plenty of examples of burial-chambers which certainly never had barrows,<sup>50</sup> and it seems to me highly likely that the majority of the sub-megalithic type never had any barrows. It is just possible that those examples of the Zennor type that now have no barrows, and all the sites in the Longhouse group, never had barrows, but on the whole it seems improbable.

It should be clear from the forgoing that to talk vaguely of dolmens in southern Britain is to imply a non-recognition of the many morphological groups which may be distinguished in that region. Nor does any one of these groups correspond to the Montelius definition of the dolmen. In fact the theory of the Montelius dolmen is as inapplicable to England and Wales as it is to Iberia and Brittany, and also, I suspect, even to Scandinavia. As was said at the outset, the word dolmen can be, and is, used in a variety of ways : but it must be emphasized that as the Montelius definition is morphologically the most restricted that has ever been given to the word, other uses must connote even less morphological exactness. Apart from this it seems not unreasonable to ask that when archaeologists use the word dolmen with reference to the burial-chambers of western Europe, they should specify with what implications they do so. The French peasants of the Morbihan at the present day give the name dolmen to all megalithic burial-chambers, whether they be passage-graves, gallery-graves, 'lichavens' or 'simple' denuded chambers. This is Bonstetten's use of the word and it is a legitimate and useful one, which, were it not for the other varied and unfortunate uses of the word, could perhaps be recommended. The present writer however would prefer to see the word dolmen dying out of archaeological parlance, even as it is at present disappearing from the revised sheets of the Ordnance Survey maps.

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<sup>50</sup> Gor and Los Millares in southeast Spain, for example, or the Cretan *tholoi*.

## Notes and News

### MANUFACTURE OF GUN-FLINTS

The monograph of S. B. J. Skertchly<sup>1</sup> on 'The Manufacture of Gun flints' has long been recognized as the standard work on the subject. This, together with an excellent article on 'The Flint Knapping Industry at Brandon', by Rainbird Clarke,<sup>2</sup> should be consulted for an extended account of the industry.

The authors of the present note have long been interested in the technique of flint flaking, but on attempting to reconstruct the process of gun-flint making from the published descriptions, they found that an essential feature of the knapping process has not been recorded. They found also that the position of the 'Stake' or anvil relative to the knapper has not been clearly defined, while there is a conflict of evidence as to which face of the flake is placed uppermost on the stake in the process of knapping. In order to clear up these and other points the authors have recently visited the knapping workshop of Mr V. R. Edwards at Brandon and have embodied their observations, together with matter relevant to them, in the following note.

#### 1. THE POSITION OF THE STAKE RELATIVE TO THE KNAPPER

The knapper is seated on a low stool at the side of a circular bole formed of a section of a large tree trunk (elm or oak). The knapper sits with his left leg extended, tangent to, and touching the side of the bole, his right elbow closely set into his right groin and his wrist resting on his left thigh (FIG. 1).

The end of the knapping hammer is grasped in the fingers of the right hand with the thumb resting upon the flat surface of the haft to prevent the hammer turning in the hand when the blow is delivered (FIG. 1).

The stake (FIG. 2), which is of wrought iron, is set in a hole in the wood bole about 3 inches deep, and is slightly inclined towards the knapper. The shank of the stake is surrounded in its socket by a piece of leather in order to make the reaction of the stake more resilient and so reduce the shock of the blow on the wrist of the knapper, and possibly also to damp any vibration in the stake which might interfere

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<sup>1</sup> District memoir of the Geological Survey of England and Wales, 1879.

<sup>2</sup> *ANTIQUITY*, March 1935, pp. 38-56.



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with the fracture. The stake is set about 4 or 5 inches from the edge of the bole, with its long edge at right angles to the long axis of the hammer and forearm. When there is no flake in position the blow falls on the leather at the root of the stake and clears the upper edge of the stake by about half an inch.



FIG. 1. POSITION OF KNAPPER

### 2. POSITION OF THE FLAKE ON THE STAKE

The flake to be cut into gun-flints is held in the left hand with the bulbar surface uppermost and is pressed firmly on the edge of the stake, making contact on the right hand side of the stake facing the knapper (FIG. 1). The thumb is pressed on the bulbar side of the flake, while the fingers are pressed at the same time on the back of the stake and on the under side of the flake so as to secure a rigid contact.

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The long axis of the flake is inclined downwards towards the knapper, the amount of inclination to the horizontal varying from  $45^{\circ}$  to  $25^{\circ}$  according to the amount of undercut (oblique fracture) required in the fracture. The larger angles give an increased undercut. When the angle is decreased so that the flake lies horizontally on the stake the fracture becomes perpendicular or square to the surface of the flake, and there is no undercut.

The position of the flake on the stake may perhaps be made clear by a consideration of the wear that takes place on the stake which marks the place where the flakes have been repeatedly applied to its surface (FIG. 2B).

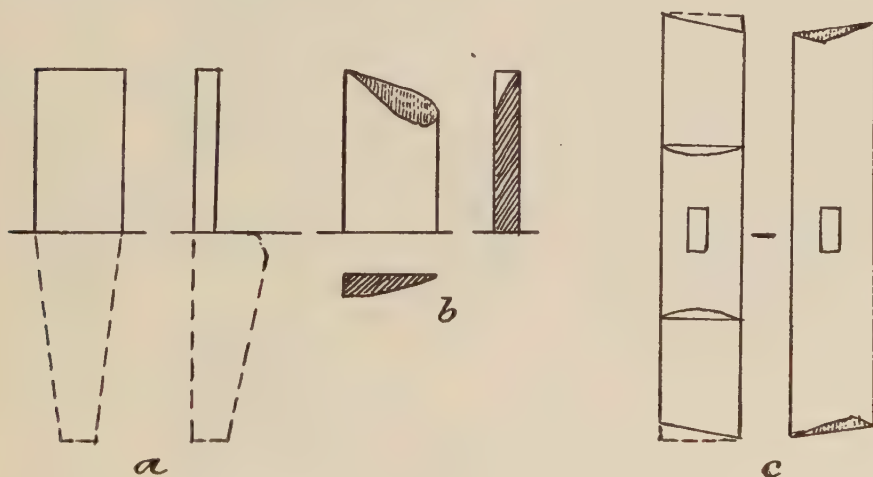


FIG. 2

a. NEW STAKE      b. WORN STAKE      c. WEAR ON KNAPPING HAMMER

It must be remembered that the flakes from which the gun-flints are made have either one or two ridges on them. These ridges are held at right angles to the edge of the stake and make a localized contact with it, and at this point the stress due to the reaction of the stake is concentrated.

The edge of the knapping hammer only covers half the width of the flake so that with flakes with two ridges the maximum compression comes on one ridge only, and it is here that the knot or cone of percussion is formed which gives rise to the undercut fracture. When the surface between two ridges is of shallow concavity the knot is formed on

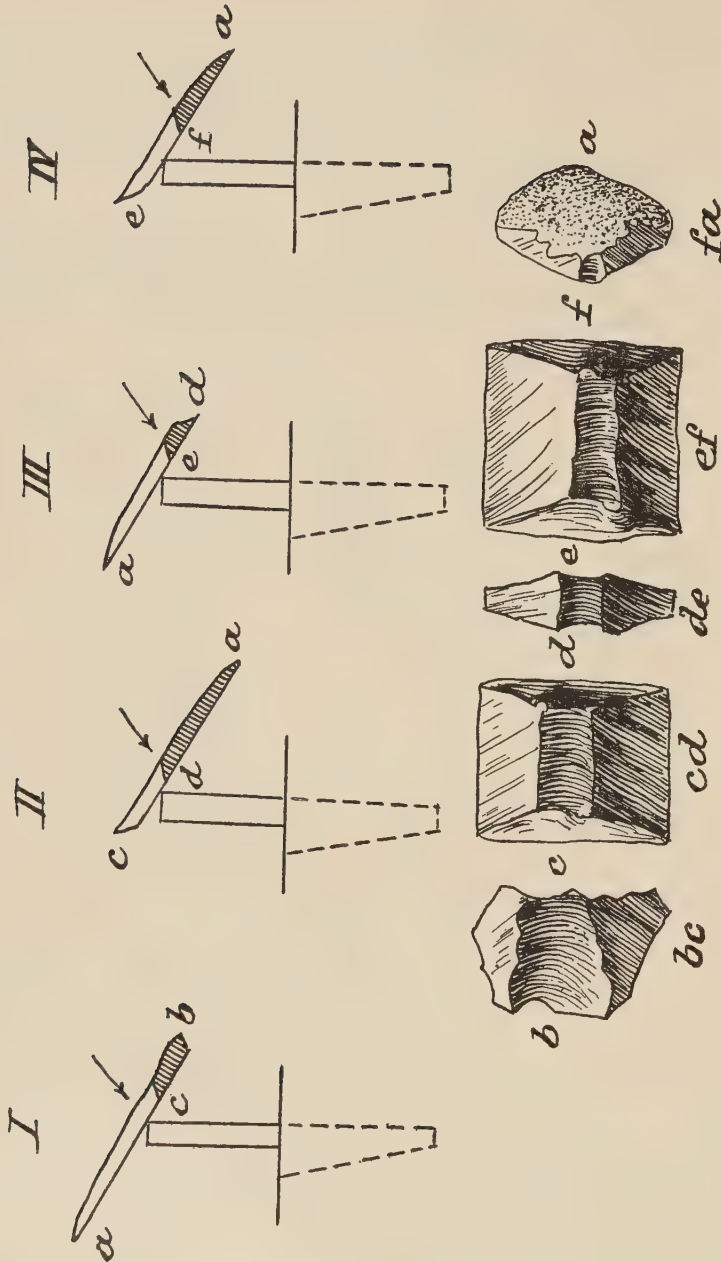


FIG. 3  
THE NUMERALS INDICATE THE SEQUENCE OF BLOWS, AND CROSS-HATCHING REPRESENTS THE PIECES STRUCK OFF WITH EACH BLOW



## NOTES AND NEWS

this surface directly under the corner of the knapping hammer. From time to time the worn top of the stake is filed square (FIG. 2A). The portion of the stake projecting above the table top is initially about  $2\frac{1}{2}$  inches long, thus allowing considerable material for removal by wear and filing.

The striking edge of the knapping hammer is about one tenth of an inch thick and about  $1\frac{1}{4}$  inches wide. When new the head of the knapping hammer is about 8 inches long and the edge is square, but when worn by use the edge becomes oblique, sloping down from left to right as shown in FIG. 2C. From time to time this obliquity is removed by filing.

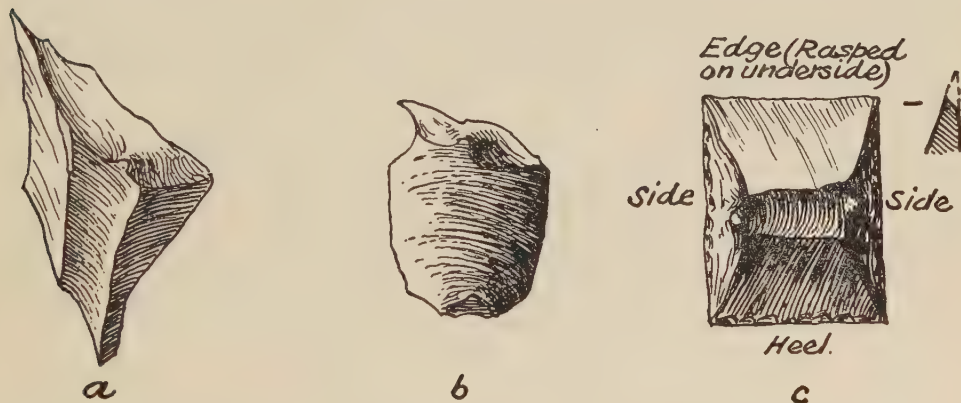


FIG. 4

- a. FLAKE HELD OBLIQUELY ACROSS STAKE SHOWING SLANTING OBLIQUE FRACTURE AND 'KNOT' OR DEMI-CONE OF PERCUSSION ON THE FACE NEXT THE STAKE
- b. TARDENOIS BURIN (SEBIL III) SHOWING DEMI-CONE OF PERCUSSION ON THE FACE STRUCK BY THE HAMMER
- c. GUNFLINT WITH DEMI-CONES OF PERCUSSION FORMED BY THE REACTION OF THE STAKE

### 3. CUTTING THE FLAKE INTO SECTIONS

When being knapped the end of the flake projects about half an inch beyond the edge of the stake and the left-hand corner of the hammer when in action is over the mid-point of the width of the flake.

The knapping blow is given entirely by the wrist, the forearm being held quite still and pressed close to the body. For thin flakes the force required is little more than that due to the weight of the hammer falling through an arc about six inches in length, but for thick flakes a good sharp blow is necessary.

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The sequence of blows necessary for making two gun-flints from a flake is shown in FIG. 3 :—

(I) The first blow detaches the bulbar swelling (the piece B-C) which is discarded as waste, leaving on A-C an undercut fracture at C.

(II) The flake is now rotated in an anti-clockwise direction through an angle of  $90^\circ$ , and any irregularities there may be on the side of the flake are trimmed off.<sup>3</sup> This done the flake is rotated through a further  $90^\circ$  or  $180^\circ$  in all. The second blow delivered at D (FIG 3, II) produces an undercut fracture which severs the first gun-flint C-D from the flake. The sides of the gun-flint are now regularized by light blows of the hammer and trimmed to the required size. The gun flint is complete except that its front edge is now rasped against the stem of the stake in order to remove a series of small squills from the plane face so as to regularize the edge and strengthen it by giving it a less acute angle (FIG. 4C).

(III) The portion A-D carries at D a fracture which is undercut in the opposite direction to that required, the small portion bearing this fracture D-E is therefore removed by the third blow which forms an undercut fracture in the required direction.

(IV) The remainder of the flake A-E is rotated on the stake and the fourth blow removes the end of the flake F-A, which is discarded as waste leaving the gun-flint E-F which is then rotated and trimmed as before.

The order of operations III and IV may be varied according to preference so that IV precedes III. Similarly there is a choice as to whether the bulbar end or the other extremity of the flake is removed first in operation I. This depends upon which edge of the flake is selected as being most suited to form the 'edge' of the gun-flint.<sup>4</sup>

The removal of the small portion D-E has not hitherto been recorded, but the operations of trimming and cutting the flake are carried out with such rapidity that it is little wonder that this stage of the manufacture has escaped notice, indeed it was only from theoretical considerations that we were led to look for it. From long flakes three or more<sup>5</sup> gun-flints can be made ; the procedure is the same as that

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<sup>3</sup> Professor Henry Balfour has informed the authors of an interesting observation made by him when watching the late Mr Fred Snare at work making gun-flints. He noted that Snare when trimming and removing irregularities from the sides and 'heels' of the gun-flint did so with a sideways, 'shearing', blow of the knapping hammer.

<sup>4</sup> Skertchly's Memoir, p. 32.

<sup>5</sup> Ibid., p. 31 and fig. 19.

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outlined except that two or more small portions D-E (FIG. 3) are cut off and discarded.

### 4. UNDERCUT FRACTURES

From a technical standpoint the undercut fractures on gun-flints are of great interest. In normal flaking the parent block bears the pit of percussion or negative conchoid, while the flake which is detached bears the positive conchoid or bulbar swelling. In gun flints the 'knot' or mark of percussion which takes the form of a demi-cone is formed by the reaction of the stake and not by the hammer. This knot is formed on the parent block (*i.e.* the flake) and the piece detached bears the negative conchoid which is exactly the reverse of the effects found in normal flaking. The demi-cone and its concomitant undercut or oblique fracture are not found in any prehistoric tools except in the Tardenois burin and its derivatives.

In the technique of the Tardenois burin as described by M. Vignard<sup>6</sup> the 'stigmat' or demi-cone of percussion is formed by means of a pointed hammer on the bulbar face of the flake, which is held uppermost and is placed obliquely across the ridge of a strong flake on a table as anvil, and the undercut fracture instead of being at right angles to the axis of the flake as in a gun-flint slants across the face of the flake. This slanting undercut fracture (FIG. 4A) can be obtained with the gun-flint technique by holding the flake on the stake inclined to the right hand or to the left instead of being square to the edge of the stake, the long axis of the flake is at the same time inclined downwards towards the operator as previously described.

The French knappers (now extinct) used a hammer head in the form of a thin disc which made a point contact on the flake, but they were unable to produce the undercut fracture by means of a single blow. They produced the undercut by removing a series of small flakes or 'gnawing' as the English knappers term it. Between 1838 and 1848 French gun-flints with their 'gnawed' edges and heels were sent to Brandon to be trimmed by the single-blow undercut fracture. The survival in England of this special form of technique may be added to the arguments adduced by Skertchly<sup>7</sup> for the continuous existence of the industry at Brandon from prehistoric times.

SIR FRANCIS H. S. KNOWLES and ALFRED S. BARNES.

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<sup>6</sup> Ed. Vignard, 'Les Microburins Tardinois du Sebilien', *C.R. Congrès Pré-historique de France X<sup>e</sup> Session, Perigueux*, 1934.

<sup>7</sup> loc. cit.



## ANTIQUITY

### PREHISTORIC SOLDERING AND WELDING

The following note is an abstract of a paper read before the International Congress of Prehistoric and Protohistoric Sciences at Oslo, in August 1936, by Herbert Maryon, on 'Soldering and Welding in the Bronze and Early Iron Ages'. It was published in *Technical Studies in the Field of the Fine Arts*, October 1936. We wish to thank both Mr Maryon and Mr Christopher Hawkes for their help in producing the abstract.

The Near East was 2000 years in advance of western and northern Europe in the technical processes of metal-working. The processes of making soldered joints, beaten hollow-ware, cored castings, and the setting of stones reached the West long after they had been in general use in the East.

Investigation of the technical processes employed in making the gold earrings of x-sectioned fabric from graves of the Mycenaean period at Enkomi, Cyprus, and Tell el-Ajjūl, Palestine; and the earrings and 'Tara' torcs of identical design but of different construction, found in Ireland, Great Britain and northern France, shows that the Western examples were made before a knowledge of soldering had reached our shores. Their period is the Middle Bronze Age, and examples of the early use of solder in western Europe do not occur before the Late Bronze Age. These 'Tara' torcs and earrings were made by hammering out a rectangular bar of gold into an x-section.

A solder may be defined as 'any metal or alloy *whose melting-point is lower* than that of the metal or alloy to be soldered, which may be run between the parts to be joined to fasten them together'. The use of such a term as 'autogenous soldering' involves a verbal contradiction, and should be discontinued. A valid and important distinction, however, remains between 'hard' and 'soft' soldering. Copper as an alloy with gold is from 14 to 11 times as potent in reducing the melting-point as compared with an equal weight in silver. So the amount of solder to be sought for in any specimen is correspondingly less. Three per cent. of copper is sufficient to produce an efficient solder if a temperature of 1000° C. is employed. Ancient sheet-gold was hammered out on a stone or metal anvil, and blemishes on this anvil would leave ridges in relief on the surface of the gold. The ancient goldsmith originally employed a piece of naturally alloyed gold as a solder on better quality gold, for at first he was not skilled metallurgist enough to *make* a solder deliberately by the addition of alloy.

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Examples of early soldering show traces of the solder, which flowed over and round any surface ridges. But the ancient worker had also a second method of soldering, which made possible the fine granulation work of the Greek and Etruscan goldsmith. The rediscovery of what was probably their method has been made by Mr Littledale, and the description of the process will be found in the paper above cited. The solder is made on the spot where it is used, from chemically divided copper and some of the gold from the adjacent parts of the work. This discovery throws light on the meaning of the observations by Pliny and Agricola on what they knew as 'chrysocola'. The process is readily distinguishable from ordinary 'soft' soldering, of which an early example might also be quoted.

Of welding there are three kinds—(a) pressure-welding, hot or cold, without fusion; (b) sweating together or surface-welding, without pressure. The conditions under which gold objects can be sweated together are not readily obtained, but may be discovered by considering the curves of the required temperatures; (c) fusion-welding, which may be defined as 'to join metals by melting their adjacent edges, or heating the adjacent edges, and running some molten metal of the same kind into the intermediate space'. There are indisputable ancient examples of fusion-welding. Now 'casting on' or 'burning on' are processes of *casting*, quite different from the above, with which we are familiar in early work. But the question is, did the goldsmiths of Sumeria, Egypt, Greece, Etruria, or Ireland employ the processes of sweating or fusion-welding? The answer is definitely 'no', for those examples of their work which have been claimed to be sweated or fusion-welded are really soldered by the hand soldering process already noted. But their joints have been over-fired. By accidentally raising the temperature to about 1000° C. the ancient worker produced soldered joints which are indistinguishable from those produced by fusion-welding, for the quality of the solder in a joint depends upon the temperature to which the work is raised.

The result of the investigation is the clearing up of obscurities which have long been current and a useful warning to archaeologists to make sure that when they use technical terms they know what they are talking about. In the case of the 'Tara' torcs, a series of earlier studies of their technique is hereby in large part superseded (see *Man*, 1932, 222, with rep.), but we are left with an important new chronological point in the history of prehistoric craftsmanship in the West.

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### CAUSEWAYED SETTLEMENTS

The origin and function of the neolithic British 'causewayed' settlements has long puzzled archaeologists. The type is best represented at the classic type-site of Windmill Hill, Wilts, and at Whitehawk, on Brighton race-course, Sussex. The characteristic feature of settlements of this type is the surrounding ditch (or ditches, for there are often several) broken by numerous causeways of solid chalk, evidently left undug for some definite but obscure motive. These causeways are plainly visible on the surface and can be seen, for instance, at Knap Hill, where the type was first recognized in 1908 by Captain and Mrs Cunnington (*Wilts. Arch. Mag.* 1911-12, xxxvii, 42-65).

At the Trundle post-holes, set obliquely in the ground, have been found (*Sussex Arch. Collns.*, LXXII, 106-11; *Archaeology of Sussex*, by E. Cecil Curwen, 92, plate 5). This, together with the abundant remains of pottery and of hearths, seems to prove that the so-called ditches were in fact used as habitations. This explanation, first put forward at Windmill Hill by the Abbé Breuil, and subsequently advanced independently, after his excavation of the Abingdon site, by Mr Thurlow Leeds, seemed at first incredible yet incontrovertible. Since then more evidence has accumulated, all pointing in the same direction. The Beni Mguild today dispose their tents in a circular formation, keeping their flocks and herds protected in the middle. Gaps are left at frequent intervals, to allow passage for them, but are blocked when they are within by a hedge of thorns (*ANTIQUITY*, 1933, vii, 345).

Now comes archaeological evidence, from Khalepye in the province of Kiev, U.S.S.R. 'The settlement was circular in plan, enclosed by a single row of houses, with doors [gates ?] opening on the enclosed space, the whole resembling a fort, into which the domestic animals were driven at night for protection. The houses were built of clay, and were about 20 metres long' (*Nature*, 26 Dec. 1936, p. 1103). The villages lived by means of agriculture and cattle-breeding, with hunting as an auxiliary occupation. The culture was of the Tripolye type.

Here then, in a region and culture which may have remote connexions with our own British neolithic, we find a plausible parallel that may explain our causewayed settlements.

One is tempted to go further and speculate upon the origin of the hill-fort itself. Is it not possible that it may have originated in some such disposition as this? A feature characteristic of some of our 'forts' especially those of Cornwall, such as Chun, is the fact that there is an



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almost continuous circle of huts crouched round the inside of the innermost rampart and built immediately beneath it. May this be a survival of the older tradition? Or is it merely utilitarian, to obtain shelter from the wind? (If so, those on the northeast segment did not get much!) Once the need of defence from outside arose, and was met by the construction of a rampart and ditch placed outside the huts, it would obviously be absurd to leave gaps for the enemy to enter; and the cattle could still be kept in the central space. Such a theory assumes a continuous evolution on the spot, and is unfortunately not applicable in this country, where there seems in every known instance to have been a considerable gap between the first (Neolithic) and the later (Iron Age) occupation, as, for instance, at the Trundle and Maiden



VILLAGE OF GOTTSCHINA, NEAR LEIPZIG

Castle. But it may have occurred abroad if occupation was continuous. Perhaps future excavation will decide the matter.

Again, is it merely fanciful to detect a survival of this earliest 'Ringwall' type of settlement in some of the modern nucleated villages of Central and Eastern Europe? Students of village-types have recognized one such that they usually call 'Slav', where the houses face inwards to a central open space. The houses themselves are disposed in a circle or rough oval, and their gardens, orchards or paddocks run out behind, usually to a road. In the central 'village green', whose area is relatively large, stands the church, and there is usually a pond. Travellers in Eastern Europe will be familiar with the type. It is common in Transylvania, where the churches are often fortified, and sometimes (as at Neithausen [Netus], where the tower is used to hang up sides of bacon) serve also as village store-houses. No doubt the type is determined rather by geography than by race, and the term 'Slav'

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should be used with due reserve. The fact that such villages occur in Transylvania, where Roumanian, Magyar and German cultures meet and mix, should instil caution. Nevertheless geographical and other factors may have caused it to develop and survive longest in regions now occupied by Slav and Slavonic cultures. It is at least curious that modern representatives (if such they are) of the type should still survive in a region where the prototype is known to have flourished, and where it may have been invented.

But the example of the Beni Mguild warns us that the type may also have been invented independently more than once.

Meanwhile let us distinguish clearly between speculation and ascertained fact. That the Khalepye discovery is connected, typologically at any rate, with our causewayed settlements seems at any rate to be a good working hypothesis. We shall look forward to seeing the full publication of the results of the excavation, especially the plan of the site. One feature about which we hope to be given full information is the nature of the ground upon which the houses were built. Were they built upon the flat (natural) surface of the ground, or upon excavated trenches? If the latter, the analogy with our sites will be very close.

O.G.S.C.

## MAT-MAKERS OF HULEH

Lake Huleh is the northernmost of the three lakes in the Jordan valley. Beds of papyrus grow in it, and provide materials for an interesting handicraft—that of mat-making. The mats are used as walls and roofs for huts. The industry may claim to be one of the oldest in the world, for reeds (if not papyri) were used to make the oldest known habitations in the adjacent region of Mesopotamia. It is desirable that its technique should be studied before it is too late because the lake is shortly to be drained and turned into agricultural land. Being malarious, one cannot regret its forthcoming disappearance. But it is all the more important that steps should be taken at once to survey the whole region. The anthropological aspects are particularly interesting, because of the ‘Ethiopic’ (or ‘negroid’) character, certainly of the people and possibly also of the flora and fauna. We strongly support the plea for an anthropological study of the Huleh region made by Mrs Crowfoot in the *Palestine Quarterly*, October 1936, p. 230, and would call the attention of the authorities to its importance. Articles by Mrs Crowfoot herself (P.E.F., *Quarterly Statement*, October 1934, p. 195) and Mr Theodore Larsson (*ibid*,

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October 1936, pp. 225-30) have admittedly merely scratched the surface of a most fascinating subject, their visits being of a few hours only. It is now admitted that when Governments are obliged to destroy the past in the interests of the present and future, they incur an obligation to record what they annihilate. That obligation was recognized by the pre-war Archaeological Survey of Nubia, which rescued from oblivion some of the remains submerged by the building of the Aswan Dam. The principle is recognized, though not always implemented, in Great Britain. A Cabinet Minister said recently: 'A public conscience has at last been roused to the fact that man does not live by bread alone, and that governments have a duty in archaeological matters which is no less a duty than the provision for social and material progress and welfare'.\* It is a duty which is recognized almost universally, and often generously, by other countries. We hope that the Palestine Government will not be behind modern requirements in carrying out an obvious duty involving small expense and bountiful returns.

The anthropology—again in the widest sense of the term—of the Fertile Crescent and of Egypt is still largely an unworked field, whereas the archaeology of those regions has been more fully developed. But modern survivals can illuminate the past and make it real, and they will not survive much longer. Let not posterity have cause to reproach us of having yet once again been too late (or too mean) to do our duty. Otherwise we shall have earned the stinging sarcasms with which Stukeley has immortalized the memory of Farmer Brown at Avebury. We are now doing our best to repair the damage there, two hundred years too late. But how much better it would have been not to have allowed it to take place!

### BULLINGTON PRIORY, LINCOLNSHIRE (PLATE I)

Bullington was founded between 1148 and 1154 by Simon son of Walter de Kyme as a priory of the Gilbertine Order. This order, established by St. Gilbert of Sempringham about 1139,<sup>1</sup> has a double interest, as it was of English origin, and had convents in which nuns,

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\* The Rt. Hon. W. Ormsby-Gore, M.P., presiding at the Annual General Meeting of the British School of Archaeology in Jerusalem (reported in the P.E.F. Quarterly Statement, January 1937, p. 17). The facts stated at the same meeting by the Director of the School, Mr P. L. O. Guy, indicate that this duty has not always been carried out. Alone of all the national archaeological schools in Jerusalem, the British School, that of the mandatory power itself, has no Government grant and no 'local habitation'.

<sup>1</sup> For history of the order, see *Victoria County History Lincolnshire*, II, 179, and R. Graham, *St. Gilbert of Sempringham and the Gilbertines*.



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lay-sisters, regular canons and lay-brothers lived together ; though the women were most strictly separated from the men by walls and rules. Such an arrangement was in no way an innovation, as joint convents for men and women had been in existence from much earlier times. The Benedictines of Fontevrault, who had important dependencies in England, had in their convents both nuns and monks, while several of the independent nunneries had monks or canons, with lay-brothers attached to them. But nearly all of these had become houses of nuns alone by the early 14th century, while the Gilbertine double houses continued until the general suppression, with the Bridgitine convent of Sion which had been founded in the 16th century.

Sempringham was the head house of the order of Gilbertines, which had 13 double convents in Britain, two of which, Tunstall in Lincolnshire and Dalmelling in Scotland, only survived for short periods. There were also 12 priories of canons without nuns, with 5 lesser cells or halls. Bullington ranked fifth in importance among the Gilbertine houses, and in the early days of the order the number of inmates was limited to 100 nuns and lay-sisters and 50 canons and lay-brothers, which was surpassed by 140 and 70 at Watton, 120 and 60 at Sempringham and 120 and 55 at Chicksands and Sixhills. But it is very doubtful if such numbers were ever reached. All the houses of the order were suppressed in 1538, and the pension lists may give some idea as to the number of inmates at that time, Sempringham, with 17 nuns and 17 canons, being first, while Bullington, with 15 nuns and 10 canons, was third. The net annual value of Bullington was given as £158 7s 11d in 1535, while that of Watton, which was the richest house in the order, was over £361.

The existing remains of all the double houses of Gilbertines are very scanty, with the exception of Chicksands, where a part of one cloister, and other buildings, were incorporated in a post-suppression mansion ; and Watton, where the prior's lodging is still inhabited. At Watton, however, the whole site was excavated between 1893 and 1898, which resulted in the discovery of two complete groups of conventual buildings, each with a cloister.<sup>2</sup> These were widely separated, but connected by a long narrow gallery. Here all the various buildings could be named with some certainty from a survey, taken at the suppression, which enumerated them and their dimensions. This is the only complete plan of a double Gilbertine house so far discovered. But

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<sup>2</sup> *Arch. Journ.* LVIII, 1 ff, with plan by W. H. St John Hope and H. Brakespear.

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Watton, as the richest house of the order, may have had more elaborate arrangements than the others. The distance between the nuns' and the canons' buildings made it necessary to have a kitchen for each, whereas only one was allowed for by the rule. It is therefore probable that in other double houses the two sets of buildings were closer together, if not adjoining.

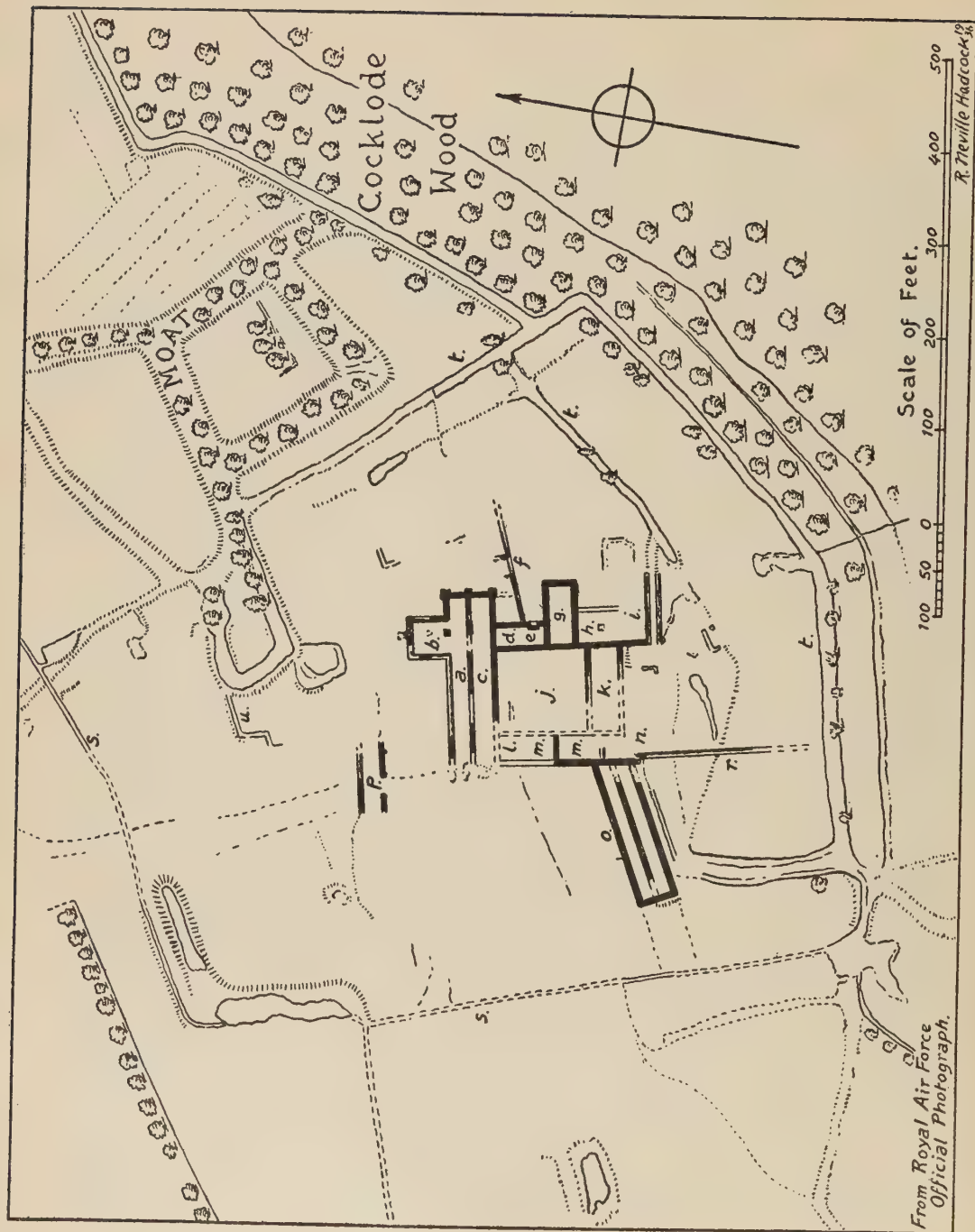
With regard to the conventual arrangement of Gilbertine houses something must be said of what the rule of the order ordained in this matter, with particular reference to the plan of Bullington. The accompanying plan (p. 216) has been made from an R.A.F. official photograph (PLATE I) without a personal visit to the site, which has not yet been excavated.

The rule of the Gilbertine order is given in full in Dugdale's *Monasticon Anglicanum* (1830, VI, part 2, pp. 1-xcix preceding p. 947). This shows that, in spite of being double convents of nuns and canons, the nuns in these houses were more strictly enclosed than in other orders, and the buildings were so arranged that the nuns and canons could never see each other at ordinary times. Communication between the nuns and canons took place by means of windows which appear to have been so arranged as to obscure vision. All business was done at the Sisters' Window, four prudent canons attending to the affairs of the house. The Great Turning Window in the Window House was attended by at least two circumspect nuns, and was used for serving meals or provisions. In the church, the nuns' choir (C) was separated from the canons' choir (A) by a solid wall, and there was a similar window here through which the nuns received holy water and the Pax.<sup>3</sup> The canons' refectory was to be so arranged that meals cooked in the single kitchen under the care of the nuns could be served to them by turning windows, and there was to be one cellarium to serve both nuns and canons. The nuns were only allowed to talk to the outer world through a slit as long as a finger and as broad as a thumb, and then only in the presence of at least one other nun. Confessions were made through a similar slit. On certain great feast days a solemn procession was made round the nuns' cloister by the whole community, but on these occasions the side windows and corners were screened by curtains so that the canons and brothers, who led the procession, could not see the nuns and lay-sisters. Except on these occasions no one was ever allowed to visit the nuns' enclosure.

Every house of the order was to be enclosed by a ditch, with a

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<sup>3</sup> *Arch. Journ.* LVIII, W. H. St John Hope, with restored plan of turning window at Watton on p. 11.



PLAN OF BULLINGTON PRIORY, LINCOLNSHIRE  
drawn from an R.A.F. official photograph (see p. 177)



PLATE I



AIR PHOTOGRAPH OF THE SITE OF BULLINGTON PRIORY, LINCOLNSHIRE. (See p. 215)  
Ph. R.A.F., Ordnance Survey  
Crown copyright reserved

PLATE II



MEGALITHIC FONT IN CHRISTIAN CHURCH, MBAU, FIJI ISLANDS; FORMERLY A HEATHEN  
SLAUGHTER-STONE. (See p. 219)

*ph.* Commander W. Burrows, R.N.



PLATE III



MODERN CAVE-LIFE AT WEST KILBRIDE, NEAR LARGS, SCOTLAND. (See p. 219)

ph. P. Saunders, Glasgow



PLATE IV



MEGALITHIC STONES, BURJ HAMA, FROM THE SOUTHEAST. (*See p. 220*)



MEGALITHIC STONES, BURJ HAMA, FROM THE EAST. (*See p. 220*)

## NOTES AND NEWS

hedge or wall. Such a ditch (s) can still be traced at Bullington, where it surrounds the site with streams and water-courses (τ). Comparing the plan of Bullington with the site plan of Watton<sup>4</sup> it will be seen that the general arrangement of these is very similar. At a later period an inner gate and wall may have been built at Bullington to make the precinct smaller on the north when the number of inmates had diminished. The building (p) may have been such a gate, while there seem to be traces of a wall (υ) which possibly connected with it, and continued to join the western ditch.

It is impossible to say from the photograph if Bullington resembled Watton in the general arrangement of its conventual buildings. The church and nuns' cloister are similar in plan, though at Bullington the church is on the north side while it is on the south side at Watton. There seem to be distinct traces of a wall running from between the church and the chapter-house in a northeasterly direction, which may have been one side of a gallery similar to the one found at Watton, with the window house possibly at (F). On the other hand, there appears to have been a strong wall (R) which stretched from the presumed site of the kitchen (N) to the water-course enclosing the convent on the south. This wall was in all probability the western boundary of the nuns' enclosure, in which case the canons' buildings may have been to the west of those of the nuns.

The great building (o) is about 150 feet long, and it is difficult to account for. At Watton the guest-house adjoined the western range nearer to the church. But this was a very much smaller building; and there the only range of similar dimensions away from the nuns' enclosure was the canons' refectory together with the end of their dormitory range, where a rere-dorter would be expected. The west end of this building at Bullington certainly appears to have been drained, so that if the canons' buildings were on the west side of the nuns' this end may have been the canons' rere-dorter, and the remainder of the building their refectory. This would seem to agree with the rules, as the kitchen (N) under the care of the nuns, would serve both refectories. The position of the nuns' rere-dorter is fairly clear (I), and the water-course (T) was probably diverted through both for flushing purposes.

The presence of the moat on the northeast of the site cannot be explained without further documentary or other evidence, but it was probably in existence long before the priory was founded, and it may or may not have been made use of by the religious inmates, except in connexion with their drainage system.

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<sup>4</sup> *Arch. Journ.* LVIII, 9.

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Unfortunately no survey taken at the time of the suppression has so far been found relating to Bullington, so that the uses of the various buildings must be conjectural except in obvious cases, which are : (A) canons' choir, (B) north transept and chapels, (C) nuns' choir, (G) chapter-house, (H) calefactory, with their dormitory above, connecting with the church, (I) rere-dorter, (J) nuns' cloister, (K) refectory. 'Probably' may be applied to (D) chapel opening into the nuns' choir, (E) slype and inner parlour, (L) slype and outer parlour, (M) cellarium under lay-sisters' and guests' lodgings, (N) kitchen under the care of the nuns. Other buildings already referred to must remain extremely doubtful unless further evidence can be obtained. R. NEVILLE HADCOCK.

## CHRISTIANITY AND PAGANISM (PLATE II)

It is well known that each new religion succeeds in turn to the 'properties' of its unsuccessful rival. Islam took over the fetish known as the black stone, still in the Ka'ba at Mecca. Its appearance suggests a volcanic or meteoric origin. It was allowed to survive by Mahomet when he destroyed all the other idols found in the heathen shrine known as the Ka'ba. Sacred stones elsewhere—in the Forum at Rome and under the Coronation Chair in Westminster Abbey—have been taken over and reconsecrated to new uses. Megalithic remains in Western Europe were often taken over thus from the older religion. Thus we read of S. Sampson sanctifying a standing stone in Cornwall by putting the sign of the cross upon it; and many Breton megaliths bear crosses on their tops today. Sometimes sacred boulders were placed in churches—or shrines built round and over them. One such has just come to light in Clynnog church, Wales, 'under the crossing a little to the north of the centre . . . It appeared to be a glacial boulder and was 6 feet 2 inches long, 4 feet 2 inches wide and 3 feet 5 inches high. Bones were found near its base'.\* There is a large boulder in the chapel of St. Constantine, Harlyn Bay, Cornwall, and in a chapel at Maplescombe in Kent are two sarsens. (Other instances will be found in *Folk Memory*, by W. Johnson, 1908, ch. 7, and in the same author's *Byways in British Archaeology*, 1912, chapters 1 and 2. Foreign instances are given in Saintyves's *Corpus du Folklore préhistorique en France* (1934-6, 3 vols.); item 2070 is a 'dolmen' with a chapel built round it; see review in *ANTIQUITY* 1937, XI, 119.

The same process is going on today on the outskirts of western

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\* For this information I am indebted to Mr Harold Hughes, F.S.A.



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civilization. In the *Illustrated London News* (16 May 1936, p. 851) was published a photograph (reproduced, PLATE II) of a pagan sacrificial stone in Fiji, re-erected and dedicated to a new purpose in a Christian church. 'Shortly before the cession of the Fiji group to Great Britain (in 1874), the dominant chief (who had already become a christian) ordered the demolition of all the heathen temples on the main island, and the removal of the stones to his island of Mbau. With this material a church was constructed. The stone which stood outside the heathen temple in Mbau, used in the days of cannibalism to dash out the brains of victims, was converted into a font'.

This information has been confirmed by Commander W. Burrows, R.N., of Suva, Fiji, to whom I am indebted for permission to use his photograph of the stone, as well as to the Editor of the *Illustrated London News* for the loan of his negative. O.G.S.C

### CAVE-LIFE IN BRITAIN (PLATE III)

Writing in 1905<sup>1</sup> the late Professor Haverfield said :—'Caves may not be comfortable residences, but they have often been inhabited even in civilized ages. Plot, the historian of Staffordshire, observes that in his day—about 1680—Thurse House cave at Alveton was definitely occupied, and many parallels could be cited from even later ages'.

On PLATE III is a view of just such a modern instance, which has a certain interest, because it shows the tremendous range of house-types (if we can express it thus) to be found in the culture of a modern civilized state. Cave-life may not form a large element in the culture of modern Britain, but it does exist side by side with other half-forgotten primitive habitations like the 'black houses' of the Hebrides.

A number of unemployed men have made 'homes' in caves at West Kilbride, near Largs, Scotland. The caves are themselves little more than rock-shelters, with dry stone walls built across the front to keep out the rain and act as a shelter.<sup>2</sup> The men live there permanently. Recently the local Town Council had to decide whether to move them out or allow them to remain; it was decided not to disturb them until suitable houses could be found at a reasonable rent.

The men regard the caves as their own property, and attempts at 'poaching' are quickly discouraged. Some of them have even given

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<sup>1</sup> *Victoria County History of Derbyshire*, 1905, I, 142.

<sup>2</sup> Similar walls are found to have existed in most ancient inhabited caves. See for instance *Proc. Soc. Ant. Scotland*, 1909, XLIII, 246 (cave at Archerfield, Dirleton, East Lothian, occupied in the Iron Age).

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names to their habitations. In the evening they either build their own fires or gather round a single communal fire.

Professor Haverfield was interested in caves because so many of those in Britain were inhabited during the Romano-British period. Cave-life, he pointed out, was not a result of the Saxon Conquest of England; the finds indicate a date in the 2nd or 3rd century as the 'floruit' of cave-life; though it may sometimes have begun earlier. But it did not continue up to the time of the arrival of the Saxons. We must therefore reject the refugee theory. Cave-life 'must be accepted as a feature, though not a common or predominant feature, in the civilization of Roman Britain'<sup>3</sup> and it seems that that statement may be true of Northern Britain.

### THE MEGALITHIC SITE OF BURJ HAMA (PLATE IV)

Reference is made (p. 483) in ANTIQUITY, December 1936, to the megalithic site of Burzahom, or rather of Burj Hama close to the village of Burzahom. A photograph (PLATE IV) of the megaliths may be of interest, as though these stones are no great distance from Srinagar they are difficult to find even when one knows of their approximate whereabouts, and in spite of their interest, they are known to comparatively few.

The excavation, the thrown-up earth of which can be seen in the photographs, is not extensive. It consists of an L-shaped hole with sides about 15 feet long and 4 feet wide, having a present depth varying from 5½ to 12 feet.

At the Office of the Superintendent of Archaeology and Research I saw all the objects which had been made over to the Kashmir Government by Dr de Terra. With the exception of a polished axe, the only one, they were not an impressive assemblage either as regards quantity or quality. The finds included undecorated pottery fragments and a moderate sized stone ring, much too small to be a mace head, possibly a weaving weight, but any assigned use would be quite speculative.

The 'black burnished' pottery, mentioned in the note referred to has not by any manner of means the significance attached to it by some. It is made today all round Pachmarhi in the Central Provinces and Belgaum in the Bombay Presidency, and no doubt at many other places besides. It is found round Pachmarhi, though in most cases with the

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<sup>3</sup> V.C.H. loc. cit., p. 201. The article contains a list of such inhabited caves in Derbyshire, together with references to others elsewhere, and it remains the best account of a curious byway of British archaeology. The caves are marked on the Ordnance Map of Roman Britain.

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burnish gone, in nearly all the cave-shelters, where its date may be as early as the 1st century A.D. It is found in sites in Northern India and is there datable to the late 2nd, early 1st centuries B.C. Its chemical composition is unlikely to show great variation. The blackness in the pottery is due to the mixture of animal excreta, mostly that of goats, with the clay.

The association dating value of such pottery, unless aided by exclusive and characteristic ornament, is nil. Too great stress on an identification with any found at Mohenjo-daro, which is only too fashionable in India at the moment, is, I feel, quite out of place in this instance.

The polished axe, a very fine one, had 'surface' written on it, and, I consider, probably came up in the course of digging the holes for a recent plantation of trees in the immediate neighbourhood. If so a depth of not more than about four feet is indicated for its original resting place.

These megaliths are undoubtedly of very ancient erection and of immense interest, but unless there is much more conclusive and striking evidence than I have been able to see, the site has no claim as an outpost of Indus civilization. It stands, however, to lose nothing in the way of value or prestige in consequence.

D. H. GORDON.

### IRON-SMELTING WITH LAKE- AND BOG-IRON ORES

Pliny, *Nat. Hist.*, bk. xxxiv, sect. 41, wrote :—' Ferri metalla ubique propemodum reperiuntur . . . Ratio eadem excoquendis venis. In Cappadocia tantum quaestio est, aquae an terrae fiat acceptum, quoniam perfusa certo fluvio terra neque aliter ferrum e fornacibus reddit '.

#### *Translation*

Ores of iron are found almost everywhere. . . . The method used for smelting the ore is the same ('as that already described', according to K. C. Bailey's translation). In Cappadocia only the question is raised whether the iron is to be placed to the credit of the water or the earth, for the earth yields iron to the smelter only where the water of a certain river has flooded it (and not otherwise. E.W.H.)

K. C. Bailey, par. 142.

Carbonate ores of iron in presence of carbonic acid and moisture are broken down into the hydrated sesqui-oxide of iron, known as brown haematite or limonite. The sesqui-oxide is soluble in water,



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and is deposited by bacteria in the form of silt in presence of vegetation (marsh plants, etc.) and still water. Lake- and bog-iron ores are both the result of the same natural process—but the latter require prolonged roasting, whereas the former need only washing and drying. The ores are phosphoric and contain greatly-varying quantities of manganese. Their smelting, therefore, requires careful temperature regulation in order that the impurities in the ores may be retained in the slags and not communicated to the iron. To secure this result the fuel employed in northern Europe was green wood and not charcoal.

Pliny's statement may fairly be considered as referring to these water-carried bacterially-deposited iron ores, for of no other commercial iron ores can it be predicated that they are carried in solution and periodically redeposited.

The district referred to is presumably the iron-bearing region of the Taurus and Anti-Taurus range in Cilicia which, according to Gowland, has a claim to be considered one of the earliest sites of commercial iron working.\* The river in question may be the Pyramus which divides Cappadocia and Cilicia and which brings down from the Taurus great quantities of silt. Doliche in Commagene was a town early noted for its iron smiths. The entire subject, however, of the distribution, method of deposition and history of the utilization of these bog-iron ores badly needs investigation. They appear to have been used in preference to mined ore in all localities in which they have been found in sufficient quantities. E. WYNDHAM HULME.

### EARLY IRON-SMELTING IN EGYPT

The terrestrial origin of the two iron pieces found in the Pyramid of Cheops (c. 2900 B.C.) and the Abydos grave (c. 2500 B.C.) having been finally determined (ANTIQUITY, Sept. 1936, pp. 355-7) it will naturally be asked from what region did Egypt acquire its ores and by what process was malleable iron obtained from them. These questions have been answered by Herr Bergrat Prof. H. Quiring, in a paper entitled 'Die Herkunft des ältesten Eisens und Stahl' contributed to *Forschungen und Fortschritte*, 1933, ix, 126-7. The paper is based upon an address to the Prussian Academy of Sciences in February 1933.

Prof. Quiring states that the Nile sands, and in particular the gold bearing gravels and sands of Nubia, contain grains of magnetite ( $\text{Fe}_3\text{O}_4$ ) of high specific gravity, and of iron content up to 65 per cent.

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\* See also Mr G. A. Wainwright's 'The Coming of Iron', with map. ANTIQUITY, March 1936.

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Investigations conducted by Prof. Dr v. z. Mühlen in Abyssinia and South Nubia between 1929 and 1931 show that about half of the residues obtained from gold-washing consists of magnetite grains. As a consequence of the introduction of gold smelting into Egypt towards the end of the predynastic period the smelters were now able to use the finely divided leaflets of gold as well as the heavier particles. The Nubian gold-washers, therefore, sent their mixture to be separated in Egypt. As a result of smelting the fine gold and magnetite grains together in crucibles, in a reducing atmosphere obtained by the combustion of Spreu (*i.e.*, the chaff of clover and straw), an iron-rich slag was formed above the liquid gold together with a layer of pasty iron. The latter was immediately available for forging.

This investigation appears to account satisfactorily for the peculiar features of the early iron manufacture in Egypt, *viz.*, its diminutive output and its unprogressive character, the high value attached to the metal as evidence by its association with gold in jewellery, and its use for beads, finger rings and other small articles. An excellent summary of the iron question, including an abstract of Prof. Quiring's address, will be found in Herr A. W. Persson's 'Eisen und Eisenbereitung in ältesten Zeit', 1934. It forms Bulletin VI of the Société Royale des Lettres de Lund, 1933-4, but can be obtained separately.

E. WYNDHAM HULME.

## A CAUSEWAYED EARTHWORK IN WEST KENT

Any addition to the list of causewayed camps is of interest, and none has hitherto been recorded from Kent. The earthwork itself has been known for a considerable time,<sup>1</sup> but its causewayed character has escaped record. Recognition has probably been hindered by a contemporary reference to the construction of an earthwork in this neighbourhood in Elizabethan times,<sup>2</sup> but if this refers to any part of the site it must be to the bank and ditch (C D vertical about 3 ft.) marked 'Elizabethan Earthwork' on the plan.

The camp (long. 51°22'0" N; lat. 0°0'35" E) stands on a small promontory, about 300 feet above sea-level, projecting westward from the gravel plateau of Hayes Common, and overlooking a large area of

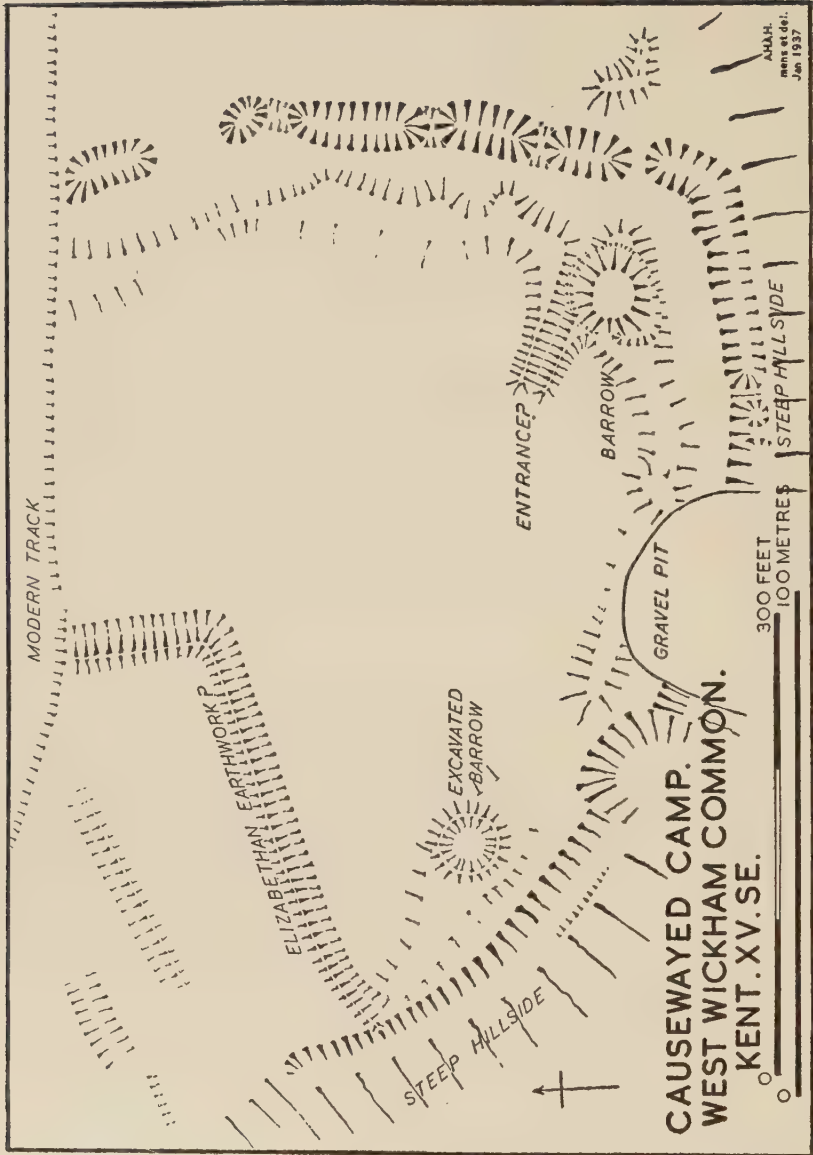
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<sup>1</sup> W. M. Flinders Petrie, 'Kentish Earthworks'. *Arch. Cantiana*, 1880, XIII, p. 13.

The plan is on a scale of  $\frac{1}{12500}$ , which is too small for certainty, but the causeways seem to be shown, although they are not mentioned in the text.

<sup>2</sup> See *Victoria County History of Kent*, vol. I, p. 402.

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open chalk country. Flint implements are common in the district, and on Hayes Common itself is an extensive series of hut circles associated with small rectangular fields. Nothing is known of their date, and there is no evidence as to their relation to the camp.

The top of the promontory is practically level, but begins to fall away to the northeast beyond the 'Elizabethan Earthwork'. Any remains on the north side have been destroyed by a road. On the south, the hillside falls very steeply, and has been dug out at the top to form a flat terrace, with a steep scarp, six feet or more in height, above. To the east, after passing two old pits which have mutilated the south side, the terrace and scarp gradually become a ditch with two small causeways. The ditch rapidly deepens, and then turns north to cross the neck of the promontory. In this north-south ditch there are five causeways of varying breadth. Three dip to about 18 inches below the ground level, the other two are level. The ditch itself is flat-bottomed and varies from about 4 feet to 6 feet in depth. The material from the ditch has been deposited in vague, low, amorphous mounds well back from the edge of the ditch. Except near the supposed entrance these seldom exceed two feet in height, and can never have been of any defensive value. Generally there is a small projection adjacent to each causeway.

Opposite the wide level causeway near the northern end the bank is continuous, but at the smaller level causeway near the southeast corner an elaboration of the plan suggests a probable entrance. Outside the ditch is a low mound, roughly L shaped. Inside, the low bank increases in height to about three feet, and a straight ditch, the bottom of which is about natural ground level, passes through the line of the bank and extends into the interior of the camp, bounded by two banks about 2 feet high. A bowl barrow, surrounded by a ditch, has been constructed on the bank, partly obscuring the straight entrance ditch. Another barrow, further to the west, has at some time been completely gutted, unless it is a pond barrow.

The causewayed ditch, and the barrow placed on the bank, both suggest that the earthwork is Neolithic, but it is to be hoped that it may prove possible to verify this by excavation.

It is possible that both the 'Elizabethan Earthwork'? of the plan and the bank alongside 'Modern Track', which overlies the northernmost (preserved) portion of the causewayed ditch are ancient field banks, similar to many others on Hayes Common, which have been referred to above.

A. H. A. HOGG and B. H. ST. J. O'NEIL.

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### GOATS FROM UR AND KISH\* (PLATES V, VI, FIGS. 1-6)

The excavations at Ur of the Chaldees, directed by Sir Leonard Woolley on behalf of the British Museum and the University of Pennsylvania, revealed a striking allegorical sculpture of the afterworld. I refer to the so-called ram, now famous throughout the archaeological world, found in the grave of Queen Shubad, who was interred with her whole household, ministers and court ladies and with great riches and many costly trinkets.

This superb sculpture is of a 'ram' reared upon its hind legs, the forelegs bound by a costly chain to a little golden tree. The basic material was of wood; the heavy gilding of the head, the curiously screw-shaped horns, the ears of lapis lazuli and the mother-of-pearl hair falling off the back, were still well preserved at the time of excavation (FIG. 1).

Woolley has already indicated that in this motif there is a forerunner of the portrayal of the Biblical 'ram caught in a thicket by his horns'.<sup>1</sup> From the classical form of the horns the animal represented was considered as a mythical creature—the invention of a Sumerian craftsman's fertile imagination. For example, in 1935 the *Journal of Heredity*<sup>2</sup> published a photograph of this object with the title 'Portrait of a Ram'. After careful investigation, the writer can state that the animal represented is a goat and not a ram. In the sculpture there is a pronounced beard of lapis lazuli, and sheep never possess beards. Furthermore, the horns of the goat from Queen Shubad's grave are directed diagonally upward and are sharply twisted. This is in direct contrast to sheep's horns, which have flat or rounded frontal portions, with an outward to downward directed spiral axis.

Even if the sculpture could be proved conclusively to be that of a goat belonging to the species *Capra prisca*, one would be unable to cite for comparison any even vaguely similar variants from the many forms of domesticated or wild goats hitherto known. The type was unusual and remained completely unknown until recent times.

This apparent inconsistency caused the writer to search for similar forms of *Capra* in the cultures of Mesopotamia, Egypt and the Indus Valley. From available data the seals of Mohenjo-Daro, Harappa and

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\* We wish to acknowledge with thanks the help of Mr Henry Field (Field Museum, Chicago) in obtaining this note. EDITOR.

<sup>1</sup> Genesis, XXII, 13.

<sup>2</sup> November 1935, XXVI, 11, cover illustration.

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Susa yield no clues. On the other hand, in the middle and upper field of the standard of Ur this same *Capra* is represented in a naturalistic pose, reared up in front of a bush. In the central section this same animal can be recognized as forming part of a tribute of livestock, which included an ox and two sheep. The repeated portrayal of one type of goat suggested that it might well represent a species of *Capra* which lived in Ancient Mesopotamia. For the time being, however, no further parallels could be found in the Land of the Two Rivers.

A search among the large animals represented in Ancient Egypt brought a welcome surprise. In the plates published by Rosellini<sup>3</sup> there often appears this same goat in the period attributed to Beni Hassan (about 2000 B.C.). This goat, however, is fattened and does not exhibit the heavy wool of the Ur specimens. There may well be a difference in stylistic representation of the Beni Hassan animals. In one case the goat is standing on its hind legs between two men. This pose strikingly resembles the Ur sculpture (FIGS. 1, 2).

Further investigations revealed that the animal portrayed in the Shubad sculpture was kept in large herds as late as the seventeenth century of our era on the shores of the Bodensee (Lake Constance) and in Vorarlberg. The *Emser Chronik* refers to the same animal and even prints an excellent woodcut of the goat and its remarkably twisted horns. In the general description the animal is clearly differentiated from another short-horned goat with spike-like horns (FIG. 3).

The work of Professor Magliano of Messina brought a further surprise during the continued research on the goat-like nature of the Shubad sculpture. In 1930 he published a paper upon a goat with curious spiral-shaped horns occurring at Girgenti in Sicily. On account of this peculiarity, Magliano named it *Capra girgentana* (FIGS. 4-6). We see in this paper the same type of goat shown in the sculpture found in Queen Shubad's grave, attributed to the early portion of the third millennium before the Christian era, still living in herds in Sicily.

There is one final link in the chain of evidence. During the excavations at Kish in Iraq, conducted from 1922-1933 by the Field Museum-Oxford University Joint Expedition,<sup>4</sup> part of the great temple complex of eastern Kish, known as Inghara, was uncovered to virgin soil. The entire deposit was approximately seventeen metres in thickness.

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<sup>3</sup> Ippolito Rosellini, *I Monumenti dell'Egitto e della Nubia* (Pisa, 1834).

<sup>4</sup> Under the supervision of Professor Stephen Langdon of Oxford University.



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During the season of 1927-1928 Mr Louis Charles Watelin, Field Director, was assisted by Eric Schroeder, and Henry Field who, as physical anthropologist, was in charge of salvaging human skeletal material for study. The nature of the soil, combined with the dampness of the deposit, preserved poorly the human bones, though a representative series was obtained. Field also collected animal bones for the study of the fauna. At the close of the season these human and animal bones from the Early Dynastic levels (c. 3000-2530 B.C.) were sent to the Field Museum of Natural History, Chicago.

In 1935 when I visited the Field Museum, the question of the identification of the Kish fauna interested me and I accepted the invitation to conduct the studies in the Hochschule für Bodenkultur, Vienna, where there is a wealth of comparative material. Among the bones were 13 fragments which when joined together formed a horn 17 centimetres in length (FIG. 5). This horn belonged to a goat, *Capra girgentana*. Furthermore, when the Kish horn is compared with that portrayed in the Ur sculpture there remains no doubt regarding the identity of the two animals. Thus we have actual proof of *Capra girgentana* living about 3000 B.C. at Kish and reproduced in sculpture by a more or less contemporary craftsman at Ur of the Chaldees. Woolley's 'ram caught in a thicket' was not a flight of fancy on the part of a Sumerian artist but an actual representation of a then living *Capra girgentana*.

The forgoing example shows with great clarity the importance for excavators to gather meticulously all animal bones for comparative study. In this manner we may gain a better understanding of the perceptive qualities of ancient artists and craftsmen. But above and beyond this, we have clearly widened our biological horizon by means of this case. Through the efforts of archaeologists and zoologists we have discovered a new domesticated animal living in Mesopotamia approximately five thousand years ago, a goat which we presumed to be entirely unknown until recent times.

Likewise this discovery warns us against considering as imaginary the fantastic and stylized works of Mesopotamian artists. They not only observed things with astonishing precision, but also reproduced them in a masterly fashion. The accuracy of detail, even in regard to the treatment of the wool, can hardly be surpassed.

Thus, *Capra girgentana*, now a pastoral resident of Sicily, also lived in Mesopotamia at the dawn of the historical period.

WOLFGANG AMSCHLER.

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### THE PYRAMIDS OF MEROË IN A JAPANESE COLOUR-PRINT (PLATES VII, VIII, FIGS. 1-4)

In Mr Basil Stewart's beautiful collection of Japanese colour-prints is one of exceptional interest. He has already published it as the frontispiece to his book *History and Significance of the Great Pyramid*, and has kindly allowed its reproduction (in half-tone) here. It is extremely rare, and in all his years of collecting and study Mr Stewart tells me he has never seen another copy. Mr Murakami, the Japanese art dealer of New Oxford Street, London, says the same. The print is, thus, perhaps the rarest work of that rare artist, Utagawa Kuninaga.

Not much is known of Kuninaga's life even yet, but since the appearance of Mr Stewart's two books, *Japanese Colour Prints*, and *Subjects Portrayed in Japanese Colour Prints*, a little more has come to light from Japanese sources. Mr Stewart tells me that it now appears that he worked between 1801 and 1829, in which year he died, aged about forty years. His picture of the pyramids was drawn, therefore, during the 214 years of seclusion from 1640-1854, when in Mr Stewart's words 'no Japanese subject was allowed to leave the country on pain of death (if he returned), and intercourse with foreigners was taboo except with a few Dutch traders who were restricted to the island of Nagasaki. These traders were therefore the only link between Japan and the outside world. Japanese ideas of foreign countries were thus confined to hearsay, or gathered from Dutch prints introduced in the course of trade. Hence native-drawn prints in the style of European landscape with attempts at perspective (not recognized in their own canons of design) were known as *rangwa* or 'Dutch pictures'. Mr Murakami has kindly given me the transcription of the title of the print :

<i>shimpan</i>	<i>Oranda</i>	<i>uki-ye</i>	<i>yegi-puto-koku</i>	<i>senkei-kodai</i>	<i>Kuninaga gwa</i>
New	Dutch	perspective	land of Egypt	pointed tall	Kuninaga drew
edition		picture		tower	

in other words 'New edition perspective picture after the Dutch (Oranda=Holland): Pointed towers in the land of Egypt: Drawn by Kuninaga'. It is also stated on the print that it was 'published by Izumiya Ichibei opposite Shimmei Temple in (the district of) Shiba, Yedo'. Yedo was the old name of the modern Tokyo.

Being limited by the date of 1829, it has not been difficult to find the source whence the Japanese artist drew his inspiration, for not many travellers had at that time published views of Egypt or Nubia. A

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search through the more obvious books of travel in Egypt proper, such as those of Vansleb, Pococke, Norden, Denon, and the *Description de l'Égypte*, shows that Kuninaga was not following any of their plates. He was not, therefore, concerned with any of the pyramids in Egypt itself.

Further, there are several things about the picture which make one think of the pyramids of Meroë near Shendy, some distance north of Khartum. Such are the steepness of the slope, which is much greater than in the Egyptian pyramids; the windows high up in the two smaller ones, which are to be found at Meroë but are entirely absent from Egypt; finally the slight base on which each is set, which in its turn may be observed at some of the Meroitic pyramids. Here the field of enquiry is even more limited than in Egypt, for Waddington, Hanbury and Cailliaud are the only travellers to have seen, and published pictures of, the pyramids in Nubia before our print must have been published in Japan. The Englishmen published their illustrated account in 1822 and Cailliaud his plates in 1823. Waddington and Hanbury's plates include nothing comparable to the colour-print, hence we are thrown back on Cailliaud. His plates indeed show a number of features which the Japanese artist selected for constructing his own picture. As is only to be expected of so artistic a nation as the Japanese, the print proves to be no mere copy of any one of Cailliaud's plates. It is self-evident that it could not be, for no Egyptian or Nubian scene ever looked like this. But it soon becomes clear that the artist has incorporated details from Cailliaud's plates,\* from which he has created a picture of his own. Those which interested Kuninaga were between plates xxxvi–xlv of volume I, showing views of the pyramids of As-sur, now known as those of Meroë. In these all the Nubian details except one will be found (cf. PLATE facing p. 233).

The rocky slope on the right with the small pyramid appearing from behind it is clearly derived from, in fact is almost a copy of, the broken rocks of Cailliaud's plate xxxvi (see FIG. 1). The window high up in that pyramid of the colour-print appears in the pyramid behind the rocks. Those in various pyramids in the middle distance of that plate supply the original for the one in the middle distance of the colour print. Windows appear in a number of Cailliaud's plates (nos. xl, xli, xlii, xliii, xliv). FIG. 4 shows those in the central portion of plate

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\* F. Cailliaud, *Voyage à Méroé, au fleuve blanc, au-delà de Fâzoql* . . . 1819–22, Paris: text, 4 vols., 1826–7; plates, 2 vols., 1823. The plates are lithographs and we regret therefore that it is not possible to reproduce the details with better results. A copy of Cailliaud is in the London Library.—EDITOR.



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xxxvii. The same plate also shows the courses of stones with which the pyramids are built, but not the stones themselves (FIG. 4), exactly as Kuninaga has shown them on his main pyramid.

Plate xxxviii, 2, supplies the original of the man with the dog in the foreground. The animal appears in the same attitude of standing to the left, but looking back at his man (FIG. 2). The man stretches out his hand to the dog in the same way, his other arm is bent to the same angle, and he wears a kilt which becomes the skirt of the Dutchman's long coat. Kuninaga's alterations are to turn the man facing the observer instead of facing the pyramid; to complete him as a Dutchman; to provide him with a long leash by which he holds the dog, and to make him employ his bent arm with this, though very awkwardly, instead of holding the spear which has been omitted.

The drawings, and more especially the sections on plates xliii-v, clearly originate the raised and panelled galleries leading to the pyramids, and their sectional walls, thin pylons, and pillars in some of the forecourts, give the idea of the supporting pillars (cf. FIG. 3). Not understanding where these supposed 'galleries' came from, the artist has cleverly hidden the end of one behind the mountain side, and that of the other behind the main pyramid. These plates also supply the idea of the shutters opening upwards from the windows, for the cavetto cornice is shown there to project forward horizontally (cf. FIG. 3). The very characteristic bases on which the pyramids are set in the colour-print are well shown in a number of the figures on these three plates and also on plate xxxiv (cf. FIG. 3).

The two date palms (see PLATE VII) are no product of Japan, nor do they occur in this run of plates from which the rest of the Nubian details have been taken. In the second volume of Cailliaud's plates there are a number of these trees (plates xv, xxxviii, xxxix, xl, &c), but none which are the evident prototypes of Kuninaga's. He gave his own version of date palms, and very good it is with the heavy bunches of dates hanging under the leaves. If he based them on any of these plates, it is curious that he should have left out the man who is almost always shown climbing up for the fruit. Another, and very strange, omission is the absence of any version of a chapel from the front of the buildings, though these are so very prominent everywhere in the original drawings. Nor has the smooth framing at the edges of the pyramids been transferred to the colour-print.

The artist has introduced much of his own into the picture. Thus, he has transformed Nubians and men in Turkish dress into Dutchmen in

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a version of European dress, supplied the dog with a leash, and filled in the scenery with trees, which are entirely absent from the original pictures of the pyramids. He has also put in the clouds through which the main pyramid pierces, such clouds being a convention frequently found in *Rangwa* prints, à l'euro péenne. Last, but strangest of all, Kuninaga has surrounded the base of the nearest pyramid with a balustrade of cut-out stones. I am quite unable to find anything in the original to account for this. Hence, I can only suppose that the artist, having no idea of the actual wrack and ruin, has thus transformed the loose stones that lie scattered about in nearly all the pictures. Mr Murakami says that this type of thing is used as a parapet to walls in Chinese and Japanese buildings. Most interesting of all the artist's introductions are the roofed look-outs, flagstaves and pennons, with which he has provided the tops of two of his pyramids. They, I am told, like the pine trees and balustrade are essentially Chinese and Japanese. No doubt the provision of these look-outs is the result of Kuninaga's description of the buildings as 'towers', and his very evident view that they were habitable. This no doubt he got from the supposed raised galleries leading to them, the windows, and the presence of men on the top, though actually the latter were the author and his party who had climbed up, as in plates xxxvi, xxxvii, xli. Yet it must not be forgotten that the Nubian pyramids were not pointed like the Egyptian ones, but truncated (Budge, *The Egyptian Sudan* I, p. 152); that several of them, at least at Barkal, are provided with a socket on the flat top (Budge, pp. 156, 160); and that Cailliaud himself discusses its purpose, supposing it to be for some ornament. He says, *Text*, III, 201 'Un trou carré, sur cette plateforme, a dû servir d'emboîture à un ornement quelconque qui couronnait le monument'. In plate XLIV, II, 12, 13, he supplies a ball on the flat top, and in his general views, plates xxxvi, xxxvii, he puts a ball on top of the perfect pyramid in the centre of the former plate, and on two in the latter (cf. FIG. 4, right-hand pyramid). Europe, thinking of the pyramids as monuments, based an opinion on this that there had been a statue on top (Budge, p. 152), and indeed the figures of the explorers standing on the top sometimes look very like statues (FIGS. I, 4). Japan, on the other hand, thinking of them as habitable 'towers', thought that there would have been a roof and flagstaff.

Thus, there can be no doubt whence Kuninaga got his ideas. This reveals a point of importance in the study of human intercourse, and also one in that of the spread of knowledge. The first is provided by

PLATE V



FIG. 1. THE 'RAM' OF GOLD, LAPIS LAZULI AND MOTHER-OF-PEARL FROM THE GRAVE OF QUEEN SHUBAD AT UR, DATED ABOUT 3000 B.C. (See p. 226)

*After Woolley*



PLATE VI



FIG. 2. GOATS OF THE BENI HASSAN PERIOD,  
EGYPT, DATED ABOUT 2000 B.C.

*After Rossellini*

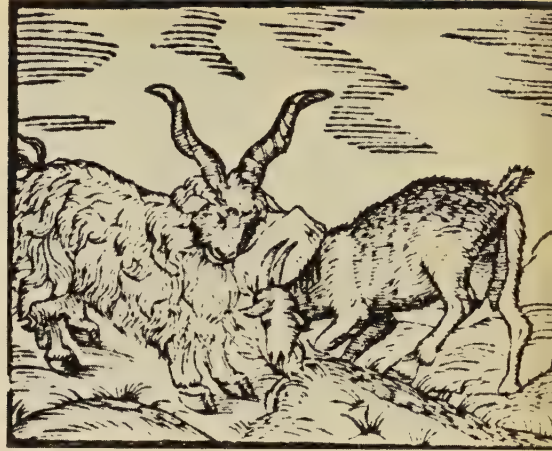


FIG. 3. QUEEN SHUBAD'S 'RAM' FROM THE VORARLBERG



FIG. 4. *CAPRA GIRGENTANA*, DISCOVERED  
BY MAGLIANO IN SICILY



FIG. 5. FRAGMENT OF GOAT'S  
HORN (*CAPRA GIRGENTANA*)

EXCAVATED AT KISH, IRAQ  
*Photograph by the Field Museum of  
Natural History*



FIG. 6. SKULL AND HORNS OF SICILIAN  
GOAT, *CAPRA GIRGENTANA*

*Photograph by the author*



JAPANESE PRINT BY UTAGAWA KUNINAGA. cf. Plate VIII. (See p. 229)  
By courtesy of Mr Basil Stewart, ph. Max Mills



PLATE VIII



FIG. 1. CAILLIAUD, xxxvi



FIG. 2. CAILLIAUD, xxxviii, 2

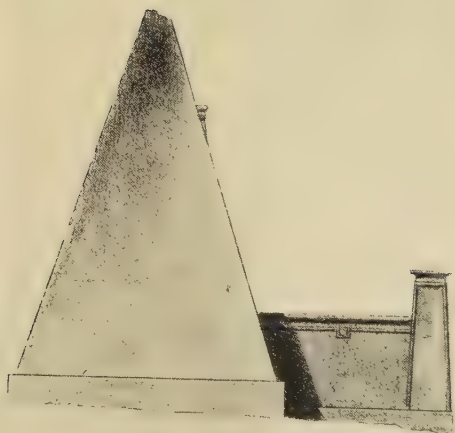


FIG. 3. CAILLIAUD, xliv, 7



FIG. 4. CAILLIAUD, xxxvii

FROM THE PLATES OF THE PYRAMIDS OF AS-SUR IN CAILLIAUD'S *VOYAGE À MÉROË*. (See p. 230)



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the dates. Cailliaud's plates were published in Paris in 1823, and Kuninaga died in 1829. Hence, there were only five or six years for the plates to have got out to Nagasaki, thence to the mainland and to have reached Yedo (Tokyo), some six hundred miles away, in time for Kuninaga to draw his inspiration from them and execute his picture before he died. Of course it is always possible that Kuninaga might have visited Osaka, where he might have seen the plates in some studio, for there was a flourishing school of artists there. This would have reduced the journey from Nagasaki by about a third, but as Kuninaga was born and lived in Yedo and the print was published there, it seems unnecessary to suppose anything of the sort. In any case, whether the plates reached Yedo itself or only Osaka, the speed with which they got there from Paris seems very remarkable for those days of sailing ships, and moreover of rigorous exclusion of foreign intercourse from Japan.

But besides the date of the colour-print, its subject is of value in other ways. For instance, it shows the impossibility of preventing trade, which will always trickle through wherever it can find even the smallest loophole. It also shows that no corner of the earth is of necessity shut off from another, no matter how distant the one may be from the other, or what the difficulties in the way may be. Nothing could be more remote from Japan than Upper Nubia, and no obstacles could be greater than the rigid exclusion laws then in force there. It is also one more witness to the part played by modern Europe in bringing unlikely corners of the earth together. An equally curious one was quoted in *ANTIQUITY*, 1936, p. 295. There it was shown that beads, instead of being sent from Cairo to West Africa by caravan as of old, now go round by parcel post to Liverpool and thence to their destination.

Finally, the existence of this print is a remarkable tribute to the interest taken by the Japanese in the outside world. If there had been no hope of a sale for such things, the picture would never have been published. But published it was, in spite of the laws which made it a criminal offence even to study a foreign book (*Encycl. Brit.* 11th ed., xv, p. 237). Moreover, it was not the first of its kind, for Toyoharu had already published a print depicting the ruins of Rome. He was earlier than Kuninaga, for he died in 1814, and like him also worked at Yedo (Binyon and Sexton, *Japanese Colour-Prints*, pp. 49, 50, 90). Let it be remembered therefore, that, as Mr Stewart tells me, these colour-prints were made for the people, not for the educated classes. Hence, even in the days of strict seclusion information about the outside world carried an appeal to the masses in Japan.

G. A. WAINWRIGHT.

## Reviews

THE ARCHAEOLOGY OF SUSSEX. By E. CECIL CURWEN. *Methuen*, 1937. *pp.* XVIII, 338, 32 *plates and 89 figures.* 12s 6d.

Sussex is a most fortunate county. Its fifty-mile stretch of the South Downs forms an archaeological region of its own. Cut off by the sea and the impenetrable Weald it can have received its civilization only by a few boatloads of refugees from the Continent and through the ten-mile neck of chalk-ridge and coastal plain connecting it with Wessex on the west. East of the Arun we have an isolated stretch of downland, now largely uncultivated, where the evolution of the old civilizations can be studied undisturbed.

But this is not all. Even the Weald itself, a few years ago described as archaeologically barren, has yielded one of the oldest of the missing links of human evolution, and has also been found to be one of the most fertile fields for the study of the Mesolithic Age. Further, the raised beaches and Coombe rock have added conclusive proof of the pre-glacial age of palaeoliths, and last but not least, west of the Arun, the coastal plain round Selsea is full of the most complicated problems of the Belgic period of the Iron Age.

Sussex too has always been fortunate in the large number of its modern inhabitants who have taken a generous and active interest in its Archaeology—the list of its active societies must rouse envy in other counties—and in nothing more so than in the selection of Dr Cecil Curwen, with his unique knowledge, both acquired and inherited, of everything prehistoric in the County, to write this volume.

With all this material around him it is natural that the scheme adopted is not the useful but rather dry gazetteer form of local history, but the far more alluring plan of a continuous account of the development of civilization in the whole area from its hungry food-gathering stages to the fat luxury of Roman times.

The first two chapters are introductory : the first a clear exposition of the 'methods and aims' of Archaeology and its ancillary sciences from Botany to Helicology, and the second the story of the geological formation of Sussex as we know it—not absolutely necessary to Archaeology perhaps as our nearest ancestors then alive were Saurians and Fishes, but so clear that one can hardly grudge it space.

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Then comes a chapter on the Early Hunter stage of man, giving the evidence largely from the lucky super-imposition of Coombe rock on the raised beach near Brighton, of the age of the lower palaeoliths, and a perfectly admirable account of the Piltdown skull and its discovery, and of the worked tools found near it ; with the reasons for its assignation to the very beginning of Pleistocene times.

In the writer's student days the record for the heaviest human brain was held by that of a Sussex bricklayer, undistinguished in life except for a love of poaching and of politics ; he was run hard by Cuvier and Thackeray. The Piltdown skull is that of the thickest headed individual in Europe. Is it a fair inference that Sussex is the region of the most rapid cerebral development ?

The Mesolithic Culture after the invention of the bow is admirably treated with copious illustrations of the flint implements and a map of their distribution on the sandy parts of the Weald.

Henceforward, when man had brought from the continent the knowledge of how ' to augment nature's fitful supply of food by the domestication of animals and the cultivation of useful plants ', and to dwell in larger communities, we are taken to the Chalk. The neolithic camps of Whitehawk and the Trundle excavated by the Author are fully described with their pottery and their meagre habitations. The scattered bones and burial at one of these show no respect for the dead and even suggest cannibalism, as some of those in the long barrows of Wiltshire did long ago to Thurnam.

The long barrows of Sussex are not up to the Wessex standard, and some of them are atypical and even doubtful. There are nine at the eastern end of the Downs at no great distance from the camps—a relation not observed elsewhere—and three at the western. The flint mines excavated by the Author and others are vividly described, and stress is laid on their output being far in excess of the local requirements, thus showing the earliest evidence of industrialism and the division of labour. The persistence of palaeolithic forms is noted, as it was during the early excavations at Stonehenge.

We are glad to find the Author emphasizing that this pastoral age, with its scanty agriculture—only vouched for in Sussex by a few sickle flints—was all really neolithic in culture through the Early and Middle Bronze Age, say up to about 1000 B.C., and that this culture was at its best towards the close. The possession of a bronze dagger (probably of foreign origin) by a few chiefs does not really establish the Bronze Age in Britain, though it is too late now to change the time-table.

The so-called Early and Middle Bronze Age is badly represented on the South Downs. The few bellbarrows are, as might be expected, at the Wessex end and disc barrows do not occur. Only eleven beakers, of which eight belong to the rounded B type of the southeast of England, have been recorded.



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It is when we come to the Late Bronze Age that Sussex has led the country in the advancement of knowledge. Dr Curwen carefully describes the three excavated sites of the 'globular vessel' and Deverill-Rimbury people which have revealed their round huts, and above all proved so clearly that it is to them we owe the introduction of the 'Celtic' field-system and our first definite corn farming industry. The chapter ends with a catalogue and well-illustrated description of the Late Bronze finds in Sussex—always '*raisonné*' and never boring—and a table of the county's hoards.

The chapter on 'Iron and the First Cities' comprises the whole 'Iron Age', provisionally dated 500 B.C. to the Roman era. We welcome the omission of the wholly unnecessary and cumbersome word 'Early'. This age he divides for cultural purposes into three phases:

Phase I (500 to 250 B.C.) began with the landings of small bands of refugees of Hallstatt culture, their settlement in open villages with undisturbed extension of the existing agricultural system, the formation of local groups (probably the seeds of tribal organization), and the erection of comparatively slight earthworks as communal refuges in times of danger. All these developments are illustrated and proved by records of excavations.

Phase II (250–50 B.C.) is the era of the strong Hill Forts of which three, the Caburn, Cissbury and the Trundle have been proved to have been permanently occupied and were evidently tribal capitals and central markets. All these, too, are fully described with plans and diagrams showing the construction of their earthworks, their timber revetments, their gates (those of the Trundle are reconstructed in the figure as opening inwards, which would surely be an unlikely weakness); and the objects from the Caburn which throw so much light on the daily life of their occupants are fully illustrated.

These two phases of the Iron Age, to which the 500 years of the Late Bronze Age must, in Sussex at least, be now added, undisturbed as they were on these isolated downs, illustrate very clearly the inevitable political developments from the pastoral through the agricultural, the home industries, and the commercial stages where land is limited and population increases. In Sussex land hunger led to tribal formation and strongly defended capitals, but not apparently to successful aggression for there is no evidence of their having been destroyed by war. In Wessex the same development can be traced but not in such peaceful simplicity. The Iron Age B invasion in the West, and the Belgic Conquest from the north of Hants have 'queered the pitch'. Many of the hill-top camps show signs of strengthening, alteration and reconstruction. St. Catherine's Hill near Winchester had its gates destroyed by fire, but whether by a neighbouring tribe or by the Belgic invaders cannot be decided till the date of the latter is more firmly fixed.

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Phase III (50 B.C. or a little later to A.D. 43) is mainly concerned with this last invasion which got as far as the Selsea peninsula and probably the Arun, but beyond that river had little influence. East Sussex and the Caburn went on undisturbed till the Roman Conquest.

At Selsea there was probably a great Belgic port, now totally submerged, for rich relics and hundreds of Belgic gold coins have been washed up on the foreshore. Chichester was probably founded to take its place. Iron was first worked, and four new earthworks sprang up in the Weald, two of which appear to have been fortified miners' camps.

With regard to this phase it is much to be regretted that so little space has been given to the numerous minor earthworks, west of the Arun, which must have a considerable bearing on the conditions and problems of the Belgic occupation. Bow Hill, Rewell Hill, Bexley Bushes and the complex cross-dykes of the Ridgeway are only mentioned as existing; while the Wardyke and the linear earthwork which continues its line and together with it cuts off all the high ground of Arundel Park, and others, do not even get the honour of a mention. Some of these are the Author's own children which he first brought to light, and so far have received little more attention than their short birth notices in 'Sussex Archaeological Collections'. It is a bad case of neglect and even of cruelty—to his readers!

The chapter on Sussex pottery and its dating is probably one of the most valuable in the book. But it is too technical for the non-specialist and the Author invites him to skip it—we will accept.

The Roman occupation was absolutely peaceful. The natives remained undisturbed in their downland villages gradually increasing in numbers and prosperity. Villas and smaller Roman houses sprang up along the sunny coast. Chichester, originally only defended by an earthwork, was walled; its rule was extended to all Sussex, and the Caburn was abandoned. The country was well provided with primary and secondary roads: three of them have recently been traced and more remain to be done. The famous Stane Street is claimed to have been made almost immediately after the Conquest on the strength of Hardham, which flourished from A.D. 50, having been a *mansio*—the pre-Roman and Belgic pottery found there being explained as a survival of these types. The more likely explanation would seem to be that it was an inhabited site before it was chosen for a *mansio* upon Stane Street. The Antonine Itinerary of the 2nd or 3rd century does not mention Stane Street, the road from Chichester to London being taken along the coast road, which was probably a strategic necessity for Vespasian's conquest of Wessex, to Clausentum and thence via Winchester and Silchester—45 miles further than by the direct road, along Stane Street. Moreover its unique form where it crosses the ridgeway on

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Bignor Hill does not look like an early construction. However this is a very minor point in a book which is as pleasant to read as it is valuable as a contribution to prehistory.

J. P. WILLIAMS-FREEMAN.

INVENTORY OF THE HISTORICAL MONUMENTS IN WEST-MORLAND. The Royal Commission on Historical Monuments, England. *London: H.M. Stationery Office, 1936. pp. LXVII, 302, with numerous plans and illustrations. 30s.*

The appearance of this authoritative inventory of the historical monuments of Westmorland is an event of far reaching importance to students of the history and archaeology of that county. The publication of a volume so wide in its scope, so accurate in detail and provided with such a wealth of plans and illustrations may well be said to bring to a triumphant conclusion the work of the late Mr W. G. Collingwood, who published his concise and carefully documented inventory of Westmorland's antiquities in 1926. Though small in area Westmorland possesses many monuments of special interest to the archaeologist. Among these may be reckoned its early village settlements, its Roman camps at Crackenthorpe and Rey Cross, with later Roman forts and roads, its mottes, castles, pele-towers, manorial halls, and lastly the old sixteenth and seventeenth century farmhouses built by the sturdy 'statesmen' of its dales.

The study of the historical monuments of Westmorland is rendered somewhat difficult by two facts. In the first place, the great ridge which runs across the county from east to west between the Pennines and the Lake hills has through the ages proved a barrier which divided two different cultures, and sometimes two different nationalities. Secondly the nature of the country and the difficulty of access to many of its sparsely inhabited portions makes the task of examining their monuments one of unusual difficulty.

Over these difficulties, however, the staff of the Royal Commission have triumphed. The list of monuments described seems, so far as present knowledge goes, to be complete. The admirable plans provided make it possible to study several hitherto little-known earthworks and village-sites, and the plans of both military and ecclesiastical buildings with hatchings to denote the dates of their various details will be a boon to many readers. The arrangement of the descriptions of the monuments under their parishes in alphabetical order—a practice followed in the Commission's previous inventories of Hereford and Essex—facilitates reference.

Every precaution has been taken to ensure accuracy. No monument is described which has not been actually visited by members of the staff and the work has been submitted before publication to eminent specialists. A special word of praise is due to the fine series of photographic plates with which this



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book is illustrated. Among these photographs not the least useful are those illustrating special types of monuments, *e.g.*, Roman inscriptions, churches, church ornaments, stained glass, chalices, castles, manorial halls, furniture, plaster work, fell-side farms.

Dr R. E. M. Wheeler supplies a valuable introduction upon Prehistoric and Roman Westmorland. He deals in an interesting manner with what is perhaps the oldest of our Westmorland monuments—the long barrow upon Rayseat Pike, adducing examples gathered from a wide field to justify the suggestion that the presence of a cremation trench in this early barrow is but another instance to show that cremation was a recognized alternative burial rite of the late neolithic phase of northern Britain. Of our stone ‘circles’, Dr Wheeler has many interesting things to tell us. It is to be hoped that the excavation planned by the Cumberland and Westmorland Archaeological Society may reveal part of the secrets of the well-known circle, ‘King Arthur’s Round Table’, near Penrith, which, with its ditch, its external embankment and its two causeways, Dr Wheeler compares on a smaller scale with Avebury though whether it was elaborated with a circle or circles of stone or timber is not yet known.

Dr Wheeler gives an interesting account of the remarkable class of remains known as ‘hut villages’, of which over fifty are included in the inventory. These settlements are of uncertain date—some may be relatively modern—but, as the writer contends, ‘they represent as a whole a cultural phase substantially prehistoric in kind and environment’. Though never fortified in the full sense of the word, they are occasionally surrounded by earthwork or stone walling. The huts, many plans of which are provided in the text of the inventory, are of dry stone walling. These settlements were doubtless occupied for the most part by pastoral communities who also practised some form of agriculture, though it is difficult to date the strip lynchets which occur frequently in the neighbourhood of the settlements. Attention is drawn to the Roman remains occasionally found in connexion with these groups of huts.

In the section of Dr Wheeler’s article devoted to Roman Westmorland special interest attaches to his account of the roads, particularly of the remarkable one which, leaving Brougham, pursues its lofty course along the ridge of High Street descending to Troutbeck, presumably to join some hitherto unverified road from Watercrook or Ambleside. This road is the *Brethstrett* or Britons’ Road of the thirteenth century and may have been an adaptation of a previously existing British track.

Professor F. M. Stenton contributes a valuable essay upon ‘Pre-conquest Westmorland’, in which he deals with the obscure and little-known period of the history of the district between the departure of the Romans and the coming

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of William Rufus and his Normans in 1092. We can follow, as far as the scanty evidence will allow, the invasion of the Angles and the subsequent penetration of the Norsemen into the dales. The period closes with the long struggle for the possession of Cumberland and north Westmorland between England and Scotland.

An additional and most welcome introductory article is an account of Anne Clifford, contributed by the editor. That remarkable lady left the impress of her vivid personality upon so many monuments of north Westmorland that some account of her life, about which, thanks to the labours of Dr G. C. Williamson, we have learned much in recent years, is a useful commentary upon many of the historical monuments of the Eden valley.

The Royal Commission has placed us under a lasting obligation by providing us with a book which is not only beautiful in itself but compiled with a thoroughness and attention to detail which will make it an indispensable part of the equipment of the student of our local antiquities for many years to come.

W. T. McINTIRE.

THE PLACE-NAMES OF WARWICKSHIRE. By J. E. B. GOVER, A. MAWER and F. M. STENTON in collaboration with F. T. S. HOUGHTON. English place-name Society, vol. XIII. *Cambridge University Press*, 1936. pp. LI, 409 and 4 maps. 21s.

The volumes published by the Place-name Society are not only a store-house of information for research workers in many and various branches of study, but they tend more and more to do the research work itself by concisely summing up results for all who may be interested. It remains for the reviewer to summarize the points which seem important.

As might be expected, the place-names demonstrate the two great divisions of Warwickshire, namely the Arden and the Felden; in other words, they help to define the original area of the Forest of Arden. This division is graphically shown by two of the maps provided, which give the locations of *lēah* (and *ge-haeg*) names and of *tūn*, *ingtun* and *hām*, *ingaham* names. The former names, which show settlements in the clearings in the forest, are plotted thickly in the region west of Avon leaving the region to the east almost entirely bare, while the latter group of names, which indicate farms in the more open country, leave a bare space on the part of the map where the forest was. The forest district was hardly penetrated in early times: even 'the usual peasant tenements of the middle ages, the virgates and half-virgates of the open-field system, rarely appear in the earliest charters from this country'.

As mentioned in the preface, Arden was the largest woodland of Anglo-Saxon England. Its name is still attached to various of its villages from

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Tanworth in Arden on the western border of the forest to Weston in Arden (parish of Bulkington) on the east. It also extended from the neighbourhood of Birmingham in the north to Henley in Arden in the south. The name 'Arden' is the same as 'Ardennes', and is derived from a stem *ardu*, 'high', 'steep'. This district, like that in Belgium, is comparatively high country.

To the north of the county, in the forest area, many farms and isolated hamlets were built in small clearings; in the south of the county, in the Felden, the larger villages prevailed with their open fields around them. The word Felden seems to have been applied also to other open country outside the forest. For instance it appears in Fieldon Bridge near Atherstone: this is the bridge over the Anker which leads to the more open country beyond the river in Leicestershire.

In Anglo-Saxon times the woodland separated two cultures, that of the (Saxon) Hwicce and that of the (Anglian) Mercians. The former had moved up the Severn valley from the southwest, the latter up the Trent valley from the northeast. It is suggested that the boundary between them may appear in two place-names, Bishop's Tachbrook and Martimow. In the former, 'Tach', according to Ekwall, derives from an O.E. word *tāecels*, 'boundary', which may have referred to the brook dividing the Hwicce diocese of Worcester from the Mercian diocese of Lichfield. Martimow is a field-name which probably derives from *Mercna mere*, 'boundary of the Mercians'. The field is in the parish of Radway, in the diocese of Lichfield, where it adjoins the parish of Kineton, in the diocese of Worcester.

There are but few names in this county which indicate the sites of pagan practices. The only one which may derive from *wēoh*, 'temple', is Willey, near the junction of the Fosse Way with Watling Street. Weoley, now within the administrative county of Warwick, has already been dealt with in the volume on Worcestershire. The name of Tysoe, which lies above the Vale of the Red Horse, is a specially interesting one since it signifies the *hōh* or hill of Tiw. It 'provides for the first time unequivocal evidence for the local worship of the god Tiw in England', and 'proves that the Hwicce, within whose territory the village lay, had reached the south of what was to become Warwickshire at a time when primitive heathenism was still in full vigour amongst them'.

The presence of two of the most important Roman roads, the Watling Street and the Fosse Way, accounts for the various Strettons, such as Stretton Baskerville on the former, and Stretton on Fosse and Stretton on Dunsmore on the latter. Stratford on Avon indicates the presence of an important cross-road which crossed the river here and joined the Ryknild Street at Alcester. The name Bretford presumably signifies the 'ford of the Britons' which took the Fosse Way over Avon. The Romans are also responsible for the names of Alcester,



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the *ceaster* on the Alne, and Mancetter. 'The first part of this [latter] name is clearly a reduced form of the old British name for Mancetter, preserved for us in the Romano-celtic form Manduessedum'.

Scandinavian names are few, since Guthrum's kingdom did not extend west of Watling Street. The few that there are, such as Rugby, are close to the eastern or northern boundary. Celtic and Norman names are also few: Brailes is the most important of the former; Beaudesert of the latter. But the number of names of Anglo-Saxon origin, especially those compounded with personal names as showing their original owners, is very great: there are about ninety, apart from minor names.

Twelve pages are devoted to river-names, with appropriate references to Ekwall's book, to road-names, especially Portways and Saltways—which latter have been a special study of Mr Houghton\*—and to miscellaneous names such as Arden and Dunsmore.

At the end of the book are notes on place-name elements and their distribution. There are nearly fifty examples of the termination *cot(e)*, a higher proportion than in any other county so far dealt with, except Devon. 'There appear to be no examples in Warwickshire of parishes distinguished by east, west, north, south, nor by the dedication of the church'. WILFRID BONSER.

THE TEMPLE OF KING SETHOS I AT ABYDOS. Copied by AMICE M. CALVERLEY, with the assistance of MYRTLE F. BROOME, and edited by ALAN H. GARDINER. Vol. II. Joint publication of the Egypt Exploration Society and the Oriental Institute of the University of Chicago. *London and Chicago*, 1936. *pp.* 2 and 46 *plates.* £5.

The Egypt Exploration Society and the Oriental Institute of the University of Chicago have united in an important publication dealing with the reproduction of all wall-reliefs and inscriptions in the renowned Temple of King Sethos I (c. 1300 B.C.) at Abydos. The architectural and religious historical peculiarity of this Temple is that it is dedicated to seven deities; it has seven entrances, seven slightly ascending corridors pass through the transverse halls, seven sanctuaries form the finish. The pictures of these seven sanctuaries form the contents of the first two volumes of this magnificent publication. Vol. I was devoted to the three northern chapels, sacred to the god-family of Osiris-Isis-Horus. Volume 2, now under review, contains the pictures of the four adjoining southern chapels dedicated to the gods Amun, Re-Harachte, Ptah, and the deified King Sethos I. The Sanctuary of Amun, the supreme god in the New Kingdom, is in the centre. As in vol. I, the pictures and text—throughout of religious content—are reproduced with remarkable clarity from

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\* See Trans. Birmingham Archaeol. Soc., vol. 54.

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drawings of photographs after most careful collation from the originals by Gardiner and de Buck. Some of the photos, and particularly a few exceptionally beautiful coloured plates, show clearly the artistic form and high quality of these reliefs. These reliefs of Sethos I, although belonging to an art-epoch later than the renowned Amarna period, are some of the most delicate works that Egyptian art has ever produced. We should be grateful to Miss Calverley, who, in the large coloured plate II, gives us a splendid example of her ability as a painter, and to her collaborator, for this gift, and we hope that future volumes will likewise bring us material for learning and pleasure for the eye.

A. SCHARFF.

HISTORY IN THE OPEN AIR. By HENRY JOHN RANDALL. London : Allen and Unwin, 1936. pp. 164. 4s 6d.

The pioneer and his followers in any branch of learning make their conclusions known to only a small body of experts in that branch ; inevitably therefore some one must take the important step of passing on the accumulated knowledge, in some palatable form, to that fluid and capricious body known as the ' general public '. This popularization is valuable, since the writer must have at least a general knowledge of the subjects with which he deals, and an ability to describe difficult things in a simple but not childish way.

Mr Randall would never, one imagines, regard himself as belonging to the order of pioneers ; but he can with justice claim a very high place in the ranks of those who popularize, in the best sense, the knowledge of the specialist. Throughout, whether writing of roads, of villages, of the requirements of archaeology, or tilting with windmills like Mr Belloc, he shows a gusto and manifest enjoyment of his subject which are equally commendable. The articles published here are all based on sound common-sense, and urge the claims of the practical archaeologist ' this side idolatry '.

The popularizer is always faced with the task of making adequate generalizations from particular facts ; and in this respect Mr Randall sometimes nods. For instance, the description of the run-rig system on p. 83 is in the past tense ; but this system still survives in the northwest of Scotland (an interesting case from Skye appeared in the Scottish papers during last summer). Again, while the first element in Walcote and Walton may be ' serfs ' or ' Britons ', it may also be ' wood ', ' wold ' or ' wall ', or even ' stream ' (see Ekwall, *Oxford Dictionary of English Place-names*, p. 471), and in Scotland also ' spring '. Further, house-names are not so useless as may seem at first sight ; a semi-detached residence named ' Blairgowrie ' may be significant not only of the mentality of the owner, but also of his place of origin.\* To Bradley's classification of place-

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\* Or of the man who built it. But in either case the number of emigrants must be colossal !  
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names as either easy or obscure, and Mr Randall's addition of names which appear easy but are really difficult, we may add a fourth class, of words which look so easy that they have been thought difficult, but are really easy—a sort of 'double bluff'. The classical example of this is the small hamlet of Beeswing, in Dumfriesshire, which was tortured into every shape by philologists, till it was discovered that, in a house-that-Jack-built way, the hamlet was called after an inn which was bought and named by a man who had successfully backed a horse called Beeswing!

One point more. In a popular or semi-popular work, examples are necessary; they are as indispensable, in their own way, as diagrams or maps; both are lacking here.

A. MACDONALD.

### LINKS IN THE HISTORY OF ENGINEERING AND TECHNOLOGY

FROM TUDOR TIMES: the collected papers of RHYS JENKINS, formerly senior examiner in the British Patent Office. *Printed for the Newcomen Society, at the University Press, Cambridge, 1936. pp. x, 248, 7 plates and 26 text figures.*

Since the formation of the Newcomen Society in 1920, of which Rhys Jenkins was a founder member, the history of Engineering and Technology has become recognized as a subject well worth study. In this province the name of Rhys Jenkins has been long pre-eminent, and he holds an established reputation for engineering knowledge, sound judgment and wide research, and above all for historical accuracy. The volume has been published by the Society as a token of regard, and to collect in accessible form articles published in many periodicals. Jenkins's researches covered a wide field and much of his material was gathered from little known sources. The industries dealt with were studied on the spot, and local information made of full use. His writings are also models of modern methods of historical research.

The contents of the volume are grouped under the headings of Mechanical Technology, Steam Engineering, Foundry Work, Hydraulic and Sanitary Engineering, and Industrial and Economic History.

The first section begins with the history of the treadmill, with special reference to an early sketch of a man-power engine for which John Payne obtained a patent in 1573. Then follows an account of the iron slitting-mill, largely used between 1600 and 1830 for producing small rods for nail-making. Connected with this is a biography of Bevis Bulmer, an English mining engineer who flourished between 1586 and 1610. The fourth paper deals with the Vauxhall Ordnance Factory of King Charles the First, with which the Marquis of Worcester and Sir Samuel Morland were afterwards connected. The site was purchased in 1629, and an inventory of the establishment, taken in 1645,



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is preserved in the Record Office. Interesting references are made to leather guns, multiple-barrel guns, and models of perpetual motion. Other papers and notes deal with the use of fast-and-loose pulleys for disconnecting machinery from prime movers, railways in the 16th century and the origin of the spring balance.

The history of the steam engine occupies considerable space and includes Jenkins's masterly lives of Savery and Newcomen.

Some interesting particulars of ironfounding are given. The earliest known iron casting in this country dates from the 14th century, and the earliest reference to an iron foundry concerns one at Buxted in 1491.

The making of boilers for steam engines is traced from the time of Savery, when they were of copper. Small hammered iron plates were in use as early as 1726, and Smeaton was making complete iron boilers in 1772; in 1790 rolled iron plates were available.

The papers on Industrial and Economic History begin with a very complete history of paper-making in England from 1495 until 1788. The first mill was set up by John Tate at Hertford about 1495 and the vicissitudes of the trade are fully recounted and various patents described. The Hollander, or rag-engine, which displaced the old stamping machine, was introduced into England about 1750. The alum industry in England during the 15th and 16th centuries is dealt with in detail. Until about 1450 most of the alum consumed in Europe came from Asia Minor, while the earliest recorded attempt to make it in England occurred in the reign of Elizabeth. The history of the tinplate industry in the Neath district, where it was started early in the eighteenth century, is one of the most informative in the volume. A useful feature is the list of patents granted during the Commonwealth and Protectorate, which do not appear in the printed indexes of the Patent Office.

Almost every article in the volume reveals an intimate knowledge of the history of the inventions described and Mr Jenkins has made them of additional value by the results of his examination of original records preserved in public and private collections. He has used every kind of material which throws light on the subjects of his various papers. The illustrations selected for the volume are of great interest.

E. A. FORWARD.

ENGLISH CHURCH SCREENS: great roods screenwork and rood-lofts of parish churches in England and Wales. By AYMER VALLANCE. *B. T. Batsford*, 1936. 25s.

Those who have long been awaiting Mr Vallance's book on screens will not be disappointed. He treats the subject from a structural point of view, allotting a chapter each to the great rood, the celure, the tympanum and doom, rood-windows, screens and the rood-loft. In other chapters he deals with local

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types and peculiarities ; gold and colour decoration ; dates, donors and craftsmen and the post-Reformation history of screens. The information given is founded on a deep study of local and contemporary documents, references to which are given, while the magnificent collection of photographs and drawings illustrates every aspect of the subject. A minor defect of the book is the author's habit of referring to illustrations without giving the pages on which they occur. It is also unnecessary in a book dealing with such a typically English subject as parish church-fittings to use the abominable word 'Ambonoclast' while 'oxotic' (p. 54) is presumably a misprint. The list of plates arranged under counties is a useful feature, and the coloured reproductions of medieval paintings are a great embellishment to a volume which will give delight both to those in quest of knowledge and to those who love beauty. DINA PORTWAY DOBSON.

CORPUS VASORUM ANTIQUORUM. United States of America : University of California. Fascicule I, by H. R. W. SMITH. *Harvard University Press*, 1936. *pp.* 60, and 62 *plates.* 22s 6d.

The collection described in this fascicule is at Berkeley. It was acquired largely through the generosity of Mrs Hearst, mother of William Randolph Hearst. The bulk of the finest vases are her gift.

The period covered is from the Geometric to the 4th century and all the vases except for a small Etruscan group are Greek. Among them we notice a fine Cuman Geometric oenochoe, a Corinthian plate with a superb central lotus and palmette design, a 'Chalcidian' amphora of merit, a lovely fragment 'bought from a boy at Akraiphia in Boeotia' of an Attic little-master cup with a frieze of stags and sirens, an 'Andrian' cup, and some unusually nice black-figure vases. The editor gives us a lively note on the 'Chalcidian' controversy, and throughout is careful in his descriptions and his facts. Indeed, his text is highly satisfactory and thorough. Attic red-figure is here well represented, though there are no masterpieces. An interesting kylix by the Brygos painter and some works of Makron raise the level. Another kylix showing a woman bathing at a basin is attractive work by a minor artist, and a Nolan amphora of a youthful horseman is a fine acquisition. But the large nuptial lebes of the latest style is a horrid example of the rapidity of the decline of painting. This collection, little accessible to the average European student, is well and faithfully published. S. CASSON.

VIKING SETTLERS IN GREENLAND. By POUL NÖRLUND. *pp.* 160, *illustrated.* *Cambridge University Press*, 1936. 7s 6d.

There are not many books describing archaeological exploration that one reads through at a single sitting, enthralled and forgetful of the critic's duty ;

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but this is emphatically one of them. Most of us are quite rightly suspicious of excessive praise in a review, and I very much hope I am not paying an old friend of mine an embarrassing compliment when I say that his book is the best and most exciting work of its kind that I have ever read. This is not merely because the story itself, the tragedy of the remote colony of the Norsemen suffering its awful and ineluctable doom, is impressive to an unusual degree; nor is it because the investigation of the settlements produced such unexpectedly dramatic results. It is because the tale is so extraordinarily well told, with a directness and unemotional simplicity that has in no small measure the quality of the antique saga-style at its best. Dr Nörlund has been well served by his translator, Mr W. E. Calvert, for the text is entirely free from the awkwardnesses of expression that we find so often in English versions of Danish and Scandinavian books; and, apart from 'almost never' in the picture-caption on p. 59, which would read more comfortably if written 'seldom', the whole book is a commendable example of dignified smooth-reading prose. In content it is a summary of all the recent writings on the Greenland colony, and it deals with the recorded history of the settlement from its foundation to its final extinction, and the daily life of the bishops and people as revealed by exploration of the ruins of their churches and homesteads. Nörlund's finds are now famous, and there are few who have not heard of the series of medieval costumes that were discovered, though they are no longer 'the only specimens in the world', as Professor Minns says in his foreword, 'of the common folk's clothes from the later Middle Ages'. The book gives a very full account of these remarkable discoveries. The most valuable piece was the walrus-ivory crosier-head of Bishop Jon Smyrill, who died in 1209. This is now believed to have been made in Iceland by a woman, known to be a skilful ivory-carver, who was in the service of Bishop Paul of Skaholt.\* It looks very much like English work and the miniatures of the contemporary Icelandic manuscripts, which have recently been sumptuously published by Dr Hermansson, show how close the connexion was between the medieval art of Iceland and that of our own country. T. D. KENDRICK.

UPPSALA HÖGAR OCH OTTARSHÖGEN. By SUNE LINDQVIST. English summary. *Kungl. Vitterhets Hist. och Ant. Akademien, Stockholm, 1936.* pp. xii, 363, and 25 plates. 25 Kr.

This fat, finely illustrated work is mainly concerned with the three famous 'King's Mounds' at Uppsala, and with 'Ottar's Mound' which lies to the northwest of them in the Vendel parish. These huge tumuli covered the funeral-pyres of the early Uppland kings, about whom considerable early

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\* Icelandic Illuminated Manuscripts of the Middle Ages. (*Corpus Codicum Islandicorum*, vii), Copenhagen, 1935.



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literature exists, and much speculation has been devoted to the identity of the persons buried therein, the work of Birger Nerman, which was largely inspired by Stjerna's studies, holding the field prior to the appearance of this book. Lindqvist agrees with Nerman's attribution of the western mound at Uppsala to Adils ; but he assigns the eastern mound to Egil, and the central one to Aun, in these cases reversing the attributions of Nerman. Ottar's mound is with some confidence referred to the king of that name. The literary evidence upon which these opinions rest should be tested with care by those archaeologists who do not like the new chronology of northern Migration Period antiquities proposed by Lindqvist some years ago and subsequently supported by a very few other brave spirits such as the present reviewer. The evidence is not entirely conclusive ; but the combined force of the Ynglingasaga and the Ynglingatal is of almost irresistible strength in this matter of Ottar's mound, as historians are willing to concede, and all the attempts hitherto made to break the attribution of the tumuli to a small group of Svitjod kings whose central date is *c.* 500 have failed. The result is that Lindqvist reaffirms the early dating of certain antiquities found in the barrows that according to orthodox belief could not have belonged to royalties of so early a period. In this book he wisely refrains from controversy, and seeks to present the evidence of the mounds in a strictly impartial and objective manner. It is a thoroughly sound work, and all archaeologists will appreciate Lindqvist's painstaking scholarship. T. D. KENDRICK.

VORGESCHICHTLICHE KULTURKREISE IN EUROPA : Bilderatlas mit erläuterndem Text. By NILS ÅBERG. *Copenhagen : Levin and Munksgaard, 1936. pp. 80 and 55 plates. 29 Danish crowns.*

The only culture-cycles treated by Dr Åberg are the Nordic and the Danubian. West Europe is ignored (save for the illustration of some Early Bronze Age Irish axes and goldwork) till from La Tène times it can be treated as a Central European colony. The Mediterranean area is equally neglected, save that Dimini is expressly included in the Danubian cycle and a plate (without commentary) is devoted to the 'North Italian development' during the Bronze and Early Iron Ages. On the other hand the Nordic Cycle of the Stone Age is made to include not only the megalithic cultures of the North Sea—Baltic coasts and their rather doubtful relatives inland (Walternienburg-Bernburg, Globular Amphora and what I call Danordic cultures), but also the battle-axe cultures and even the Scandinavian dwelling-place cultures. So too Mondsee and Laibach, Erösd and Tripolye, like Dimini, are reckoned as groups within the Danubian cycle.

For the Stone Age the Nordic cycle is given pride of place, but the Nordic Bronze Age is summarized in a single plate exposing Montelius' typological

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divisions. The Central European Bronze and Iron Ages are treated more fully, though by typological periods rather than by cultures, on the lines laid down in *Bronzezeitliche und früheisenzeitliche Chronologie*. Even for the Migration Period Continental and British manifestations of the 'Germanic Culture Cycle' are presented before the Scandinavian ones.

All these cultures and periods from the beginning of the New Stone Age to Viking times are illustrated by figures, grouped on 55 plates and presenting type-objects—for the Stone Age primarily pots; for later periods bronzes and art-objects. The figures have been well chosen to give students a convenient conspectus of type-fossils. No plans of graves or dwellings are included, and there are some other odd omissions. For instance, no strike-a-lights are figured, not even those so characteristic of the Roman and Migration periods in the North. Though bell-beakers are grudgingly included, the daggers and buttons distinctive of the culture are omitted. The figures are admirably reproduced, but often excessively small. A graver defect in a work for students is that no scales are indicated and objects of all sizes are set side by side, irrespective of their real magnitudes. So a series of bell-beakers are reproduced, some about an eighth, some a quarter-size, and leading up to a wrist-guard, reproduced half-size so that it looks bigger than the pots.

The text expounds concisely and without elaborate argumentation the interpretations that the author has defended in detail in his numerous books and articles. In the introduction it is insisted that the spread of relics, at first confined to isolated foci, over wider and wider areas need not denote 'the appearance of new peoples in hitherto uninhabited areas, but only the gradual advance of civilization into regions, previously unrepresented, or represented only fragmentarily, in the archaeological material'. Despite this original introduction the discredited theories of Kossinna remain all too prominent in his pupil's exposition. The sound conception, just quoted, is in practice used primarily to justify the thesis of an autochthonous northern origin for the battle-axe cultures. But this theory is being rapidly abandoned. Only this month Dr Schwantes has submitted it to an annihilating criticism in the fourth part of his masterly *Prehistory of Schleswig-Holstein*, and last year Dr Tode published a no less conclusive refutation in Kossinna's own journal, *Mannus*. Again the graphic presentation of the relics from the Nordic stone cists as a final phase of the Stone Age is misleading; the text does not make it sufficiently clear that the Stone Cist Period is really a Stone-Bronze Age coincident with period I of the North European Bronze Age, as Bohm, Forssander, Sprockhoff and Schwantes have recently been insisting. So too, the premature suggestion that the rectangular 'house-plans' of Köln-Lindenthal (actually foundations of barns\*)

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\* See note and illustrations, *ANTIQUITY*, March 1936, pp. 90-1.

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are due to the 'influence' of Nordic houses, like the dwellings at Troldebjerg on Langeland, is just a survival of the old superstition that any long rectangular structure, whatever its function and material, must be Nordic. Dr Åberg has presented us with a handy illustrated catalogue of type-fossils to which a pre-historian, adequately grounded in general theory and familiar with the look of actual relics, can conveniently turn for information on points outside his special province. But students should use it only with caution. V. G. CHILDE.

THE SYNTAX OF THE GENITIVE CASE IN ARISTOPHANES. *By* JAMES WILSON POULTNEY. *Baltimore: Johns Hopkins Press; Oxford University Press, 1936. pp. xv, 235. 16s.*

A genitive in Aristophanes is, to the ordinary scholar, much the same as a genitive anywhere else; and Mr Poultney has not drawn attention to any notable peculiarities in his author. He has divided all the genitives into classes and sub-classes with laboured subtlety. We are inclined to class together as possessive genitives Sophocles' Plays, Sophocles' Son and Sophocles' Socks, but the last only, it seems, is a pure possessive; the first is a genitive of authorship; the second, one of personal relationship—not of origin, which comes four chapters later. Surely consistency demands that the offspring of a man's body should be analogous to the offspring of his mind; why then should parenthood and authorship be discussed in separate chapters?

Undoubtedly, too, some Greeks, like some modern peoples, regarded a wife as a valuable asset or possession; not so Mr Poultney, who classes 'my ducats' under § A, 'my heart' under § B and 'my daughter, wife', etc., under § C. J. F. DOBSON.

HISTORIC CYPRUS: a guide to its towns and villages, monasteries and churches. *By* RUPERT GUNNIS. *Methuen, 1936. pp. 495, 6 illustrations, 7 plans and folding map. 8s 6d.*

The professional archaeologist is always only too willing to welcome the work of the amateur archaeologist or the antiquary, provided that work shows a real capacity for original research, as contrasted with the mere collection of facts from the work of others, and a strict adherence to the usual methods of investigation and research agreed upon as essential to the normal procedure of archaeology. Mr Gunnis' compact book is an admirable example of precisely this kind of work. Resident for some years in Cyprus, he has methodically visited and examined the 670 villages and 1800 churches and chapels of the island and here recorded the results of a meticulous observation. Cyprus need no longer be looked upon as an island, the Government of which neglects, destroys or is oblivious to its superb monuments. This book is issued as a full-dress



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official guide, replacing finally the otherwise excellent guide produced by Storrs, in so far as that guide dealt with the antiquities.

Mr Gunnis is obviously an enthusiast for the medieval and the Byzantine. That is all to the good, for it is precisely those periods that have been most neglected. But he does not ignore the other periods and here consults the official excavators and museum experts to advantage.

But the main advantage of this guide is that no traveller to Cyprus need think that in any place he is in a region devoid of interest. Nor need he think that this is a mere catalogue of places of antiquity and importance. The pages are packed with incident, and with diverting local legend and history, here often recorded for the first time. Indeed, the author can be said to have made a serious contribution to original research in so far as orthodox legend and history are concerned. Students of Byzantine art and ritual will find much material to help them. The author has not missed a single icon of artistic merit or forgotten to note a single local custom of importance. The only subject not referred to is the varied modern Cypriot methods of pottery-making, Cypriot crafts and Cypriot village-architecture, all of which have archaeological significance.

As might be expected, many strange characters flit through the pages. There is Miss Eliza de Lusignan of Lower Edmonton, the last of her line ; Guelph, 4th Duke of Bavaria and Eric I, king of Denmark, who both lie buried at Paphos ; Dr Wolfe who married Lady Georgiana Walpole and lived at Limassol, and later visited Bokhara dressed in a surplice and mortar-board where he was received with that geniality which only orientals can show to the demented. We are told of the entertaining mode of life at Larnaka, where the foreign consuls lived in medieval state in the 19th century for lack of anything better to do ; of the strange tale of St. Nicholas of the cats, which intrigued travellers for so long ; of the surviving paganism of Paphos ; of that putative megalith at the Tekke Um Haram ; and of that splendid Saint, patron of all tax-payers, who rode on a lion to refuse to pay his taxes, and so alarmed the collector that he was exempted—St. Mamas of happy memory. We learn also of the bronze statue at Politiko, which Ross recorded and which the natives melted down ; of the two Phoenix Park murder informers who were sent for their own safety to the only place known to the British Government to be free of Irishmen, who both died at Larnaka of remorse or drink or both ; of the superb frescoes of Asinou, recently saved and published in full ; of the canon presented by Henry VIII to de L'Isle Adam, the Grand Master.

The reader will gather that Mr Gunnis is an observant person admirably qualified to write this book. Remarkably few errors have been noted. On p. 425 the Late Bronze Age is dated a trifle too early and I can find no mention

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of the important Bronze Age tombs of Katydhata, excavated by the Museum. On p. 55 the author notes that a traveller in 1491 refers to an orb as an 'apple', as do Greeks today: here mention should perhaps be made of the widespread legend and prophecy in the Levant of the Kizil Elmas.

The book is an engaging work and the author falls into place with a long line of British travellers in the Levant. He is to be congratulated on a very painstaking and learned book.

STANLEY CASSON.

L'ÉTUDE SUR LE MIROIR ANTÉRIEUR À LA DYNASTIE DES 'HAN'. By SUEJI UMEHARA. Japanese Text, pp. 72; French Résumé, pp. 20; 39 plates, 27 text-figures. 1935.

ÉTUDE DES BRONZES DES ROYAUMES COMBATTANTS. By S. UMEHARA. Japanese Text, pp. 116; French, pp. 6; 126 plates, 37 text-figures; being Memoirs 6 and 7 of the Academy of Oriental Culture, Kyoto Institute. 1936.

These two books may well be taken together as the subject of both is Chinese bronzes of the sort we used to call Ch'in, which the Swedes call 'Huai' and which Professor Umehara and the authors of the catalogue of the recent Chinese Exhibition call 'of the Warring States', from about the sixth to the third century B.C. They do not form a very large proportion of extant bronzes, and they did not attract attention until in 1923 the late Mr Wannieck brought to Paris the famous find from Li-yu in Shanhsi, but absolutely they must have been made for a long time over a wide area, much longer than the time of the short-lived dynasty Ch'in, much wider than the district of the Huai river.

We have plates of about 150 mirrors, 60 bronzes from Li-yu (pl. I-XXVIII), and another hundred from the Huai, from Hsin Chêng, from Tsin Ts'un near Lo-yang from Shou-chou in An-hui, but mostly without provenance, preserved in Japan or U.S.A., a few in China or France, very few elsewhere. With regard to the mirrors the ornament is at first a mere diaper quite unadapted to the round field and central loop and only gradually assumes a disposition artistically consonant with the form of the object. No mirrors of the looped or any other type previously existed in China and of the words for mirror *chien* means 'a shallow dish', *ching* perhaps 'reflections in water': hence the very important conclusion that the type was imported from abroad, *i.e.* from the Steppe peoples who had it in the seventh century, and, our author thinks, derived it through the Caucasus from Elam. I am inclined to think that it really arose from the Nomads' phalera, which accounts for the loop, not a very convenient handle for a mirror. The type with the mirror in a kind of open-work box is also probably western and has analogies in Greek work, but the handled mirror, though used by the Scyths, did not find favour in China.



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The looped mirror and a squat shape of cauldron seem the only new shapes of bronzes in the style of the Warring States, but the decoration has quite a new character. On the one hand there are curiously naturalistic motives, rather aberrant from the general spirit of the style: it is just these which may find analogies in the decoration of bronzes of the Koban style in the Caucasus and to the south of it. On the other hand there is an extreme stylization, which lends itself to the building up of complicated plaited designs by a combination of simple elements. For this moulds were prepared by the use of stamps and a rich effect reached with ingenuity rather than labour. The stylization recalls that of the Steppe art and is very unlike either Chou or Yin practice.

Umehara declares in his French introduction to no. 7 his belief that the change was produced under the influence of the culture of the west: the figures in the Japanese text are only concerned with Koban axes and the belts from Kalakent whereas the references to literature include the chief books on the Steppes and the Caucasus. We cannot however gather from it just what are the exact points of resemblance. A bronze shoulder-fitting (?) dug up in Korea (p. 104, f. 37) is quite astonishingly like Caucasus work.

The production of both books is admirable, but even in no. 6 the French résumé is very short, in no. 7 it is less than four pages. Again in no. 6 there is a French list of plates and figures, but nothing on the plates themselves. In no. 7 there is in French no real list of plates, and on each of them only very little information. May we not ask the Academy of Oriental Culture to have a little more regard for the desire of occidentals to understand its work?

ELLIS H. MINNS.

SOKNOPAIΟΥ NESOS: the University of Michigan excavations, at Dime in 1931-32. *Edited by* ARTHUR E. R. BOAK. *Ann Arbor*, 1935. *pp.* 47, 13 *plates*, 16 *plans*. \$2.50.

These excavations inform us about a small ancient town in the Fayum near the Quarun lake and at a level some 45 metres below the sea. The ancient name is the 'Isle of Sobek', the Fayum crocodile god: but the site was not in fact an island in antiquity. The centre of the site had long been removed to serve as a fertilizer—the fate of so many Fayum sites—but enough remained to justify these productive and well organized excavations. The main finds of value, apart from the buildings, were papyri, the latest of which belongs to A.D. 250. The town was probably a settlement of Ptolemy II Philadelphos. There are no traces of Christianity and the town remained pagan down to its abandonment in the third century. Of the papyri the principal are a series of customs receipts complete with their seals. No literary remains seem to have been found.



## ANTIQUITY

CORINTH: vol. III, part II. The defences of Acrocorinth and the lower town. By RHYS CARPENTER and ANTOINE BON. The American School of Classical Studies at Athens. *Harvard University Press*, 1936. pp. 313, 242 text-illustrations, 10 plates, map.

The late Director of the American School and a member of the French School at Athens have combined to produce this masterly and detailed study of one of the largest extant medieval fortresses in Greece. Incidentally, since large parts of the fortress are built on early and later Hellenic foundations, the resultant survey gives us also much information of one of the most powerful forts of ancient Greece.

The American School has almost for a generation past made itself responsible for the excavation of Corinth and its district. It has covered the whole pre-historic period as well as the Greek and Roman, and now approaches the completion of its task by a careful and complete publication of the medieval. The museum at Corinth, built and organized by American initiative, is a model of its kind. The clear and beautiful photographs of this volume give the fullest information of the medieval and ancient walls, and some of the views taken from Acrocorinth are of great beauty. This medieval fortress is the first to be thoroughly examined, planned and photographed in Greece. Medievalists will now be able to refer to a standard Italian system of defence with all the relevant literary and topographical material accessible.

THE BIRTH OF CHINA, a Survey of the Formative Period of Chinese Civilization. By HERRLEE G. CREEL. *Jonathan Cape*, 1936. pp. 396, 15 plates and map. 15s.

During the last few years great discoveries have been made in China; those concerning the Stone Age and the Painted Pottery are fairly accessible to the Western reader; those made in the tombs of the Han family (not the Han dynasty) have been described by Bishop White in *Tombs of Old Lo-yang* and have led to a new dating of the early bronzes such as is set forth in Karlgren's *Yin and Chou Researches* (reviewed ANTIQUITY, 1936, x, 371); but a general statement of results, particularly those obtained by Chinese workers, and an informed survey of the state of our knowledge made by a man familiar with Chinese literature, both the ancient literature and the publications of modern researchers, has been lacking. This is what Dr Creel has given us in a short and popular form, but he claims that popular does not mean superficial, that every statement he makes is exact and well-grounded and he looks forward to giving us the grounds in a technical work—'Studies in Early Chinese Culture'. It is impossible to summarize a closely packed summary, but it may be said that here we find the latest information on the transition from neolithic to bronze



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founded on Li Chi's *Ch'êng-tzû-yai*, the gist of what the famous oracle-bones have yielded, a study of the Shang culture combining what archaeology has lately given with what was known from the old literature, and an enquiry into the real character of the change from Shang to Chou and the coming of the Feudal Age. At the end is a bibliography of some Western and many Chinese works. All this is just what we have been wanting and many of us will await the author's fuller work with impatience.

ELLIS H. MINNS.

A KEY TO MAPS. By H. S. L. WINTERBOTHAM. *Blackie and Son*, 1936. pp. 208. 5s.

As Director-General of the Ordnance Survey, Brigadier Winterbotham was concerned that first-class maps should be produced: since his retirement he has made it his concern that such maps should be in the widest possible use. But the use of maps demands not only a measure of intelligence, but a measure of skill: hence this new *Key to Maps*. Addressed to Everyman, it is written in the author's direct, commonsense style, spiced with wit and good humour, already familiar to many listeners as it comes 'across the ether'. No technical knowledge is assumed, but it is taken for granted that the reader has the serious purpose of getting the utmost from the map. Hence the treatment is systematic and thorough. Different types of maps and plans, their scales, projections and conventions are carefully explained, and there are chapters on the actual survey, and drawing, reproduction and printing off of the maps. The motorist, whether at home or abroad, is advised as to the best map equipment, while the rambler and house-hunter are not forgotten. The sections which will, perhaps, be of greatest value to readers of *ANTIQUITY* in respect of their more specialized interests are those dealing with locating oneself, locating a point, using a co-ordinate card, and 'helping oneself'. Under the last title are included clear practical directions for surveying and plotting additional detail on a map, for applying colour washes, and for map-mounting and map-repairing. All these prove costly if outside professional help is called in, but they are relatively easy to carry out at home provided one knows the right materials and implements to use, and the best order of procedure. Here it is in a nutshell! And finally the extremely modest price of this useful and friendly guide should not be overlooked. A second edition is already announced.

E. G. R. TAYLOR.

THE WORLD OF WALES. By EDMUND VALE. *Dent*, 1935. pp. xiv, 272, with 31 illustrations. 6s.

In this book Mr Vale sets out to provide the English, whether traveller or general reader, with something more than is contained in the usual guide to Wales. The book falls into two parts. The first contains a series of chapters



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which deal in turn with what Mr Vale calls 'Welsh Atmosphere', language, place-names, traditions and folklore, topography and antiquities. The second, called the 'Compendium', contains various sections incorporating useful information such as a series of notes on Welsh castles, and a 'Topographical Anatomy', giving the meaning of the commoner elements in Welsh place-names. Even if on their own ground archaeologists or good Welshmen find cause for grumbling—in the case of the former at least grumbles will be few and of minor character—Mr Vale must be given every credit for having produced a book which stands apart from others whose purpose, avowed or implied, is the same. This was perhaps inevitable. *The World of Wales* is the product of something more than a brief tour undertaken for a series of newspaper articles, and it has behind it not only many years' knowledge of the country and its people, but a deep and genuine interest in archaeology and history which is evident in the research that has gone into the preparation of the historical sections. W.F.G.

BITUMEN AND PETROLEUM IN ANTIQUITY. By R. J. FORBES.  
*Leiden: E. J. Brill, 1936. pp. 109, 54 illustrations. 5s.*

This excellent and compact piece of research largely reproduces, with many additions and improvements, the valuable information already published in a pamphlet by the same author reviewed in ANTIQUITY (December 1935, vol. ix, p. 494). All the ancient references to bitumen and petrol and allied substances are here collected and all instances of their use discussed. The archaeological evidence is full and accurate, covering Mesopotamia, the prehistoric sites of India, and Persia. Bitumen was largely used in the Middle East and India for damp courses and for the lining of tanks and cisterns. A section of the origin and use of Greek fire is of great importance to Byzantinists. It appears that Greek fire was actually projected by a double-action pump of the type invented by Ctesibios as early as 200 B.C. It was thus a true Flammenwerfer. It was also used in grenades. The secret formula was long preserved by Byzantines, but it ultimately reached the Moslems, who used it in sieges, equipping their corps of fire-throwers with asbestos uniforms. By 1400 its use had been superseded by gunpowder and it degenerated into a parlour-firework. In 1139 in Western Europe a decision was made by the Second Lateran Council that Greek fire should not be used against human beings, a decision respected for centuries, but finally abandoned in 1915.

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